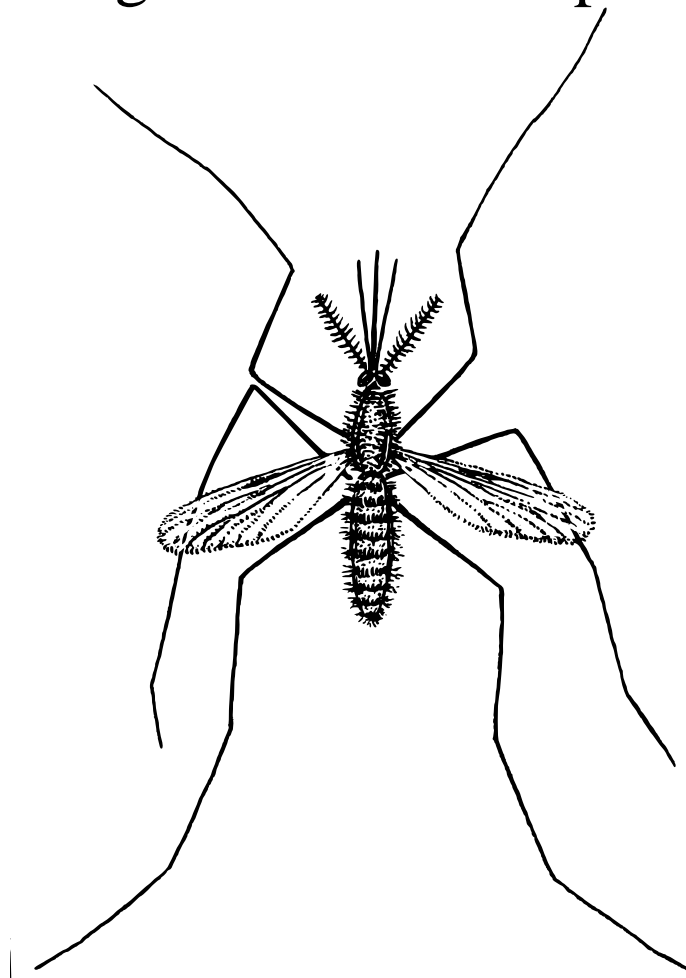


North Dakota Mosquito Surveillance Program Annual Report



2019

North Dakota Department of Health
Division of Laboratory Services
2635 East Main Avenue
Bismarck, North Dakota 58506-5520





Collaborators

Margaret Kuklok
Mosquito Surveillance Program Coordinator

Kristi Bullinger
Mosquito Surveillance Report Author

Micah Zimmerman
Summer Mosquito Analyst

Robyn Dettenhefner
Summer Mosquito Analyst

Jenna Dettenhefner
Summer Mosquito Analyst

Derrick Frieson
Laboratory Technician

Kristie Schwarzkopf
Arbovirus Program Supervisor

North Dakota Department of Health
Division of Laboratory Services
2635 East Main Avenue
Bismarck, North Dakota 58506-5520

2019 North Dakota Mosquito Surveillance Program Mission

Through mosquito collection and speciation, the North Dakota Department of Health (NDDoH) monitors the risk of infection from arboviral encephalitides that are known to occur in this region. The North Dakota Mosquito Surveillance team focuses activities on *Culex tarsalis*, monitoring for increased numbers in the New Jersey mosquito trap network and viral identification using the CDC miniature light mosquito trap network. Should mosquito populations reach significant levels or arbovirus activity is detected, appropriate recommendations for mosquito population control will be issued by the NDDoH to the vector control districts.

Table of Contents

North Dakota Mosquito Surveillance Program Background	4
New Jersey Mosquito Trap Network	
Operator List	6
2019 Network State Map	7
Network Information	8
2019 Species Comparison Graph	9
2019 Network Mosquito Count Results	9
Arbovirus Information	11
Mosquito Surveillance Risk Assessment Chart	13
Appendix A: 2019 New Jersey Mosquito Trap Data Analysis	
Introduction	14
Trap Count Graphs by Region	15
<i>Appendix B: 2009-2019 Weekly New Jersey Mosquito Trap Counts Comparison</i>	
Introduction	25
Trap Count Graphs	25
Appendix C: 2019 Weekly Live Trapping Mosquito Counts and PCR Results	
Introduction	30
Trap Count Graphs	30
WNV PCR Graphs	58
LaCrosse PCR Graphs	59
JCV PCR Graphs	61
Appendix D: 2019 Dead Bird Testing	
Introduction	62
Dead Bird Graphs	62
References	63

North Dakota Mosquito Surveillance Program Background

Since 1975, the North Dakota Department of Health has monitored the mosquito population throughout the state. The Mosquito Surveillance Program traditionally has been activated following arboviral outbreaks or flooding incidents in various locations statewide.

The program was first initiated in 1975 following an outbreak of western equine encephalitis (WEE) and St. Louis encephalitis (SLE) in the United States. In 1977, the program was officially formed under the title, North Dakota Arboviral Encephalitis Surveillance Program and housed with the Division of Environmental Sanitation and Food Protection. This program was responsible for equine and human arbovirus surveillance until 1989.

The program was reinstated under the name North Dakota Mosquito Surveillance Program in 1994 in response to flooding of the Red River in 1993. This program was operated by the Division of Microbiology until 1997.

In 2000, the North Dakota Mosquito Surveillance Program was reinstated in response to the 1999 West Nile virus (WNV) outbreak in New York. In 2002, North Dakota had its first confirmed human cases of WNV, as well as detectable virus through laboratory testing in birds, horses and mosquitoes.

The 2003, program was expanded from 50 New Jersey mosquito traps to a network of 87 traps and 18 CDC miniature light mosquito traps. These enhancements provided network coverage statewide. The 2004 program further expanded the trap network to include 94 New Jersey mosquito traps and 33 CDC miniature light mosquito traps. A video also was produced to aid in trap placement training.

The 2005, program was further expanded to 103 New Jersey mosquito traps and 39 CDC miniature light mosquito traps. The program for 2006 had 100 New Jersey traps in operation, with at least one in each county. The dry conditions during the 2006 season kept the mosquito numbers low when compared to other seasons, and it was decided to postpone any live trapping.

In 2007, due to increased *Culex tarsalis* numbers in the state, 97 New Jersey traps were used. In July, live trapping was initiated in Grand Forks, and on the grounds of the laboratory in Bismarck. Four out of 17 pools collected at the laboratory tested positive for West Nile virus. All 14 pools collected by Grand Forks and the five pools collected by Bismarck were negative. In 2008, trappers across the state maintained a New Jersey light trap network of 92 traps. Live trapping was not re-implemented in 2008 by the Division of Laboratory Services - Microbiology.

In 2009, 91 total New Jersey light traps were in operation. Despite the spread of West Nile virus and proof it is established in our state, funding for many programs is limited and live trapping was discontinued in 2010. The New Jersey light trap portion of the program has not been affected. The program was run essentially unchanged from 2010 to 2015, with varying amounts of New Jersey light traps.

In 2016, live trapping was re-instated by the Division of Laboratory Services-Microbiology on a limited basis to assess for the feasibility and utility of re-implementing the program. Five sites utilized the CDC Miniature Light Trap. The mosquitoes collected by the live traps were tested by Taqman® Real Time RT-

PCR for West Nile Virus (WNV), LaCrosse Encephalitis (LCE), Western Equine Encephalitis (WEE), St. Louis Encephalitis (SLE), and Zika virus (ZIKA). Of the 91 pools tested, 15 tested positive for WNV, with no pools testing positive for LCE, WEE, SLE, or Zika. In 2017, the live trapping was expanded to include nine sites, collecting two traps each, as well as testing for Eastern Equine Encephalitis (EEE), and Jamestown Canyon Virus (JCV).

In 2018, live trapping was performed at two sites during the day starting at week 12. Day trapping was added due to positive LaCrosse virus pools. The vector for LaCrosse virus is the *Aedes triseriatus* species, which are more active during the day.

In 2019 there were a total of 20 live and 38 New Jersey light traps active. Of the 358 live Mosquito pools tested, four tested positive for WNV and two tested positive for JCV. No pools tested positive for LCE, WEE, SLE, EEE, or Zika. In 2019 live day trapping was not utilized.

New Jersey Mosquito Trap Network

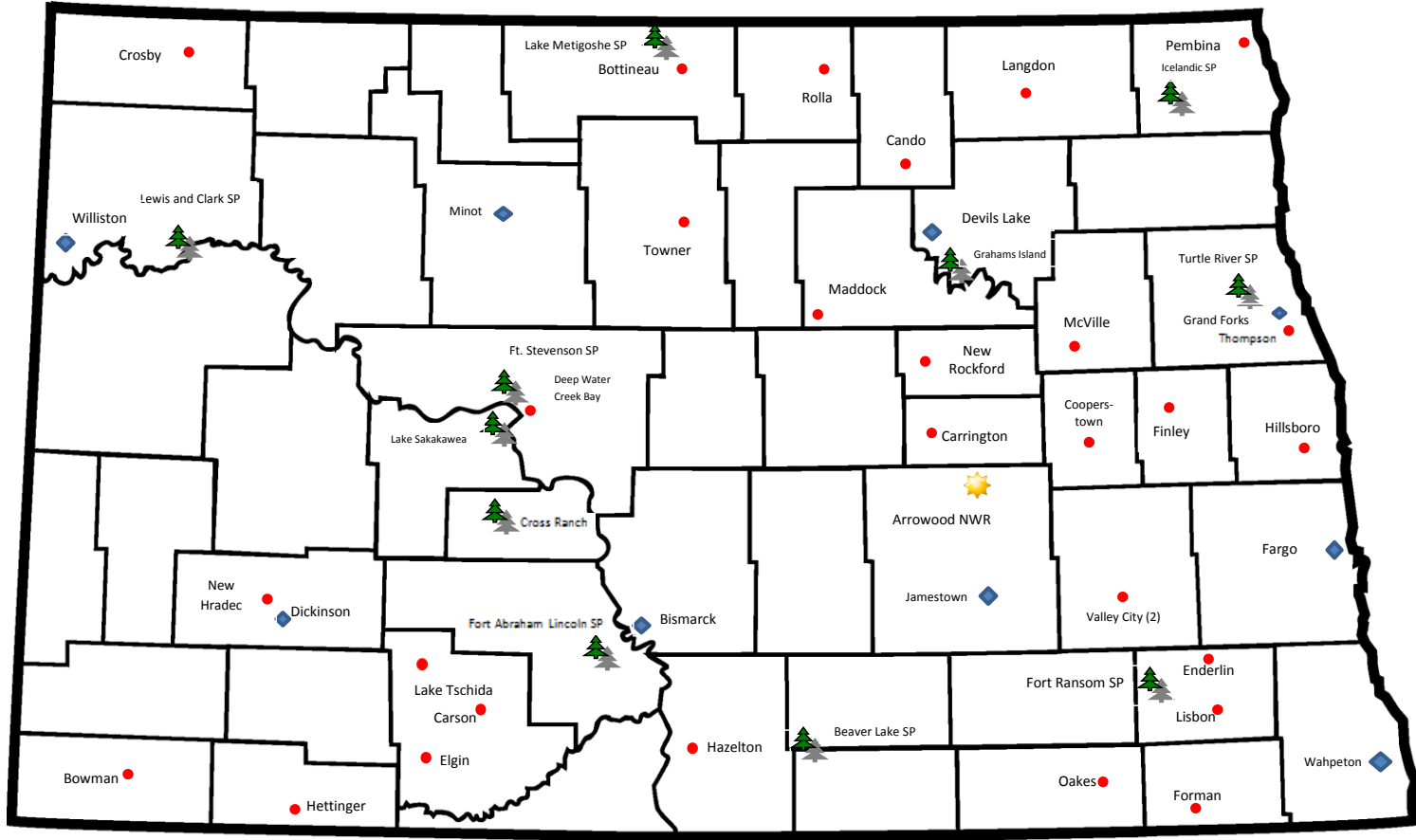
The New Jersey mosquito trap network monitors mosquito populations throughout the state. By identifying mosquito populations known to be competent encephalitis vectors, officials can determine the threat of mosquito-borne encephalitis in various regions.

Thank you to the following New Jersey mosquito trap and live trap operators whose dedication and commitment to the North Dakota Department of Health Mosquito Surveillance Program made the 2019 program a success!

*Indicates State Park ** Indicates National Wildlife Refuge ΔIndicates Live Trappers

Location	Trapper	Location	Trapper	Location	Trapper
Arrowwood**	Paul Halko	Finley	Samantha Thykeson	Maddock	Keith Winson
Beaver Lake*	James Loken	Fort Abraham Lincoln*	Dan Schelske	McVile	Ryan Johnson
Bismarck ^Δ	ND DoH Mosquito Surveillance Program Staff	Fort Ransom*	Tyler Modlin	Minot ^Δ	Lisa Otto
Bottineau	Keith Fulsebakke	Fort Stevenson*	Chad Troutman	New Hradec	Kevin Pavlish
Bowman	Max Robinson	Grahams Island*	Ryan Nelson	New Rockford	George Ritzke
Cando	Nick Brehm	Grand Forks ^Δ	Jeremy Aasen Grand Forks Vector Control Staff	Oakes	Robert Schaefer
Carrington	Lisa Hilbert & Kristin Larson	Hazleton	Bev Voller	Pembina	Lisa Hall and Gary Helland
Carson	Donna VandenBurg	Hettinger	Suzie Reuther	Rolla	Scott Hanson
Cooperstown	Nancy Paintner & Julie Ferry	Hillsboro	Jim Anderson	Thompson	Jeremy Aasen
Crosby	Jeff Jeglum	Icelandic*	Matt Korhnak	Towner	Jeffrey Smette
Cross Ranch*	Char Binstock and Eric Lang	Jamestown ^Δ	Dawn Devillers and the City of Jamestown Vector Control	Turtle River*	Shane Grove
Deep Water Creek Bay	Kerry Hartman	Lake Metigoshe*	Bill Demming and Chris Lee	Valley City	Jeff Differding
Devils Lake ^Δ	LeRoy Shereck	Lake Tschida	Duane Schatz	Wahpeton ^Δ	Josh Meyer
Dickinson ^Δ	Lee Skabo	Langdon	Jeff Hiller	Williston ^Δ	Ben Redekopp, James Taverna and Williston Vector Control Staff
Enderlin	Rick Gillund	Lewis & Clark*	Katie Ogden	McLean/White Shield	Orion Bendickson
Fargo ^Δ	Ben Prather and Fargo Vector Control Staff	Lisbon	Randy Seelig	New Town	Bruce Benson

2019 New Jersey Mosquito Trap Surveillance Sites & Regions



Cities
 State Parks
 National Wildlife Refuge
 Light Trap

The following counties are included in each region:

Region	Counties
I	Williams, Divide, McKenzie and Mountrail
II	Ward, Bottineau, Burke, McHenry, McLean, Renville, Sheridan
III	Ramsey, Benson, Cavalier, Eddy, Pierce, Rolette, Towner
IV	Grand Forks, Griggs, Nelson, Pembina, Walsh
V	Cass, Ransom, Richland, Sargent, Steele, Traill
VI	Stutsman, Barnes, Dickey, Foster, LaMoure, Logan, McIntosh, Wells
VII	Burleigh, Emmons, Grant, Kidder, Mercer, Morton, Oliver, Grant

New Jersey Mosquito Trap Network Information

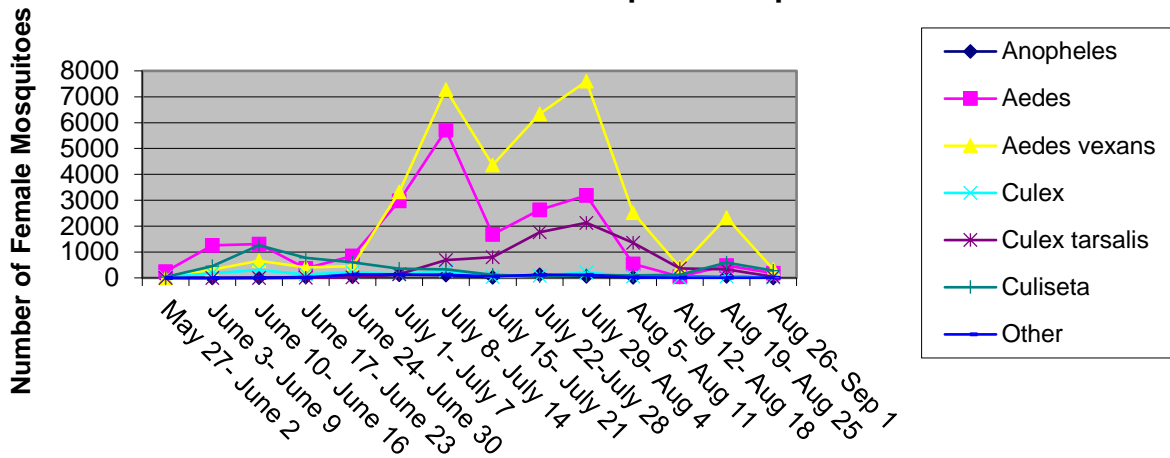
In 2019, the New Jersey mosquito trap network had a total of 38 active traps across North Dakota. There were ten traps in state parks and one in a national wildlife refuge.

At the beginning of the mosquito trapping season, usually Memorial Day, the New Jersey mosquito trap operator installs a trap in a suitable location. Using a programmable timer, the trap is set to operate from dusk to dawn seven nights a week. At the end of the seven-day period, the trap contents are collected and sent to the North Dakota Department of Health Division of Microbiology (DM) in Bismarck for counting and speciation. This process is repeated weekly until Labor Day.

At the DM, mosquito surveillance personnel sort the mosquitoes by sex and genera. Since male mosquitoes do not bite, they are of little health concern. However, their numbers are monitored because male mosquitoes hatch first, and increased numbers may indicate an increase in future female mosquito population. The female mosquitoes are separated into four genera: *Anopheles*, *Aedes*, *Culex* and *Culiseta*. These genera are then enumerated.

- *Anopheles* is associated with malaria and West Nile virus.
- *Aedes* is associated with illnesses such as canine heartworm, LaCrosse encephalitis (LCE), eastern equine encephalitis (EEE), western equine encephalitis (WEE), California encephalitis (CAE), and West Nile virus (WNV). Although *Aedes vexans* has been shown to be capable of laboratory transmission of WNV, its mammalian feeding preferences decrease its potential as an enzootic vector for WNV.
- *Culex* is the mosquito of greatest public health concern in North Dakota, since all species are competent vectors of Saint Louis Encephalitis (SLE), WEE and WNV. The species most commonly associated with encephalitis in North Dakota is *Culex tarsalis*, a principal arbovirus vector in rural agricultural ecosystems.
- *Culiseta* are monitored due to its association with eastern equine encephalitis.

2019 Female Mosquito Comparison



2019 New Jersey Mosquito Trap Count Totals by Week - Counties

Week of	Male	Female							Total female	Total mosquitoes	% Trap sites submitted
		Anopheles	Aedes	Aedes vexans	Culex	Culex tarsalis	Culiseta	Conquilletittidia			
May 27-June 2	377	0	210	0	28	0	19	0	257	634	71.43%
June 3-June 9	1,964	0	1,114	242	160	0	377	1	1,894	3,858	75.00%
June 11-June 17	1,222	5	636	418	266	0	1,050	0	2,375	3,597	82.14%
June 18-June 23	246	32	273	279	98	4	584	8	1,278	1,524	89.29%
June 24-June 30	407	19	518	293	171	13	374	12	1,400	1,807	78.57%
July 1-July 7	2,334	108	2,379	2,882	116	125	225	0	5,835	8,169	92.86%
July 8-July 14	2,564	84	2,654	4,282	125	674	179	116	8,114	10,678	96.43%
July 15-July 21	2,109	1	1,221	2,207	19	680	83	21	4,232	6,341	89.29%
July 22-July 28	4,978	79	1,690	3,523	49	1,619	45	67	7,072	12,050	92.86%
July 29-Aug 4	5,162	45	2,528	5,886	161	2,017	92	96	10,825	15,987	85.71%
Aug 5-Aug 11	3,298	10	406	1,235	47	1,287	65	14	3,064	6,362	89.29%
Aug 12-Aug 18	413	11	48	301	11	360	87	12	830	1,243	92.86%
Aug 19-Aug 25	2,181	35	397	1,512	46	282	324	6	2,602	4,783	85.71%
Aug 26-Sept 1	184	0	131	182	10	38	265	8	634	818	57.14%
2019 Totals	27,439	429	14,205	23,242	1,307	7,099	3,769	361	50,412	77,851	
2019 Trap Averages Total	726.0	9.0	380.6	219.7	78.9	203.3	23.4	13.0	1,131.5	1,857.5	

2019 New Jersey Mosquito Trap Count Totals by Week - State Parks												
Week of	Male	Female									% Trap sites submitted	
		Anopheles	Aedes	Aedes vexans	Culex	Culex tarsalis	Culiseta	Other	Total female	Total mosquitoes		
May 27-June 2	53	0	37	0	2	0	17	0	56	109	40.00%	
June 3-June 9	689	1	143	74	18	0	76	0	312	1,001	80.00%	
June 11-June 17	599	1	675	243	37	1	211	0	1,168	1,767	80.00%	
June 18- June 23	172	5	98	131	34	0	192	3	463	635	80.00%	
June 24- June 30	638	28	334	165	47	10	227	125	936	1,574	100.00%	
July 1- July 7	1082	12	593	441	20	14	132	128	1,340	2,422	80.00%	
July 8- July 14	3,230	26	3,060	3,001	154	14	151	6	6,412	9,642	60.00%	
July 15- July 21	2,284	18	462	2,159	12	119	31	33	2,834	5,118	80.00%	
July 22- July 28	3,362	42	944	2,818	38	140	17	54	4,053	7,415	80.00%	
July 29- Aug 4	837	38	455	273	40	184	24	2	1,016	1,853	60.00%	
Aug 5- Aug 11	515	12	128	1,286	10	72	29	1	1,538	2,053	60.00%	
Aug 12- Aug 18	79	16	1	110	0	8	27	0	162	241	70.00%	
Aug 19- Aug 25	1,737	26	77	816	8	46	267	0	1,240	2,977	70.00%	
Aug 26- Sept 1	168	0	56	154	0	12	12	0	234	402	20.00%	
2019 Totals	15,445	225	7,063	11,671	420	620	1,413	352	21,764	37,209		
2019 Trap Averages Total	1,036.1	32.8	415.8	338.5	143.7	158.7	30.8	28.9	1,149.2	2,098.3		

2019 New Jersey Mosquito Trap Count Totals by Week - National Wildlife Refuges											
Week of	Male	Female									% Trap sites submitted
		Anopheles	Aedes	Aedes vexans	Culex	Culex tarsalis	Culiseta	Other	Total female	Total mosquitoes	
May 28-June 3	0	0	2	0	0	0	0	0	2	2	100.00%
June 4-June 10	0	0	0	0	0	0	1	0	1	1	100.00%
June 11-June 17	0	0	0	0	0	0	0	0	0	0	100.00%
June 1- June 24	0	0	0	0	0	0	0	0	0	0	100.00%
June 25- July 1	0	0	0	0	0	0	0	0	0	0	100.00%
July 2- July 8	0	0	0	2	0	0	0	0	2	2	100.00%
July 9- July 15	0	0	0	0	0	0	0	0	0	0	100.00%
July 16- July 22	0	0	0	0	0	0	0	0	0	0	100.00%
July 23- July 29	0	0	0	0	0	0	0	0	0	0	100.00%
July 30- Aug 5	0	0	0	0	0	0	0	0	0	0	100.00%
Aug 6- Aug 12	0	0	0	0	0	0	0	0	0	0	100.00%
Aug 13- Aug 19	0	0	0	0	0	0	0	0	0	0	100.00%
Aug 20- Aug 26	0	0	0	0	0	0	0	0	0	0	100.00%
Aug 27- Sept 2	0	0	0	0	0	0	0	0	0	0	100.00%
2019 Totals	0	0	2	2	0	0	1	0	5	5	
2019 Trap Averages Total	14	0	2	4	0	32	0	0	41	55	

Arbovirus Information

More than 2,500 different species of mosquitoes are found worldwide, with about 200 species in the United States and at least 34 of these in North Dakota. The most common vector in the spread of arboviruses is the mosquito; however, not all mosquitoes are vectors in the transmission of arboviruses.

Male mosquitoes feed almost exclusively on nectar and therefore, do not bite. Female mosquitoes lay eggs that require a blood meal, so female mosquitoes bite warm- or cold-blooded animals and birds. Stimuli that influence biting include a combination of carbon dioxide, temperature, moisture, smell, color and movement. Humans are seldom the first or second choice for a blood meal. Horses, cattle, smaller mammals and birds are preferred. Although acquiring a blood meal is essential for female egg production, both male and female mosquitoes are mainly nectar feeders.

Mosquito-borne diseases cause more than one million human deaths every year. Some of these diseases include protozoan infections such as malaria; filarial pathogens such as canine heartworm; and viruses that cause dengue, yellow fever and encephalitis.

Arthropod-borne viruses (arboviruses) are the most diverse and serious diseases transmitted to susceptible vertebrate hosts by mosquitoes. Humans and domestic animals can develop clinical illness but *usually* are “dead end” hosts because they do not typically contribute to the transmission cycle. Notable exceptions include Zika virus, Chikungunya virus, and Dengue virus.

West Nile virus (WNV) is named after the West Nile region of Uganda, where it was first discovered in 1937. The *Culex* species of mosquitoes are the primary vectors, particularly *Culex tarsalis* in North Dakota. Common in many parts of the world, WNV had not been seen in the United States until late summer 1999, when it made its debut in New York. WNV traveled westward across the continent the following year, with the first human case in North Dakota being reported in 2002. West Nile fever can be characterized by fever, headache and rash, but can also present with more serious symptoms. Up to 80 percent of people are asymptomatic with a WNV infection. And although only a small percentage of people infected with WNV display symptoms, WNV can cause encephalitis (an inflammation of the brain) and meningitis (inflammation of the brain and spinal cord) in humans and animals, and even death in some cases. According the CDC website, WNV was responsible for 94 deaths in 2016 in the United States, two of which occurred in North Dakota. Additional information about West Nile virus in North Dakota is available at www.ndhealth.gov/wnv.

Western equine encephalitis (WEE) is mostly found in states west of the Mississippi River, Wisconsin, and Illinois. The primary vector is *Culex tarsalis*. Birds are the most important host. Since 1964, there have been fewer than 1,000 cases reported. Human cases have historically been reported in North Dakota; however, the last documented case in our state was in 1991. Human mortality rates are about 5 percent and horse mortality rates are considerably higher.

Eastern equine encephalitis (EEE) is spread to horses and humans by infected mosquitoes. Annually, there are a small number of cases nationwide, although no cases have historically been reported in North Dakota. Most cases of EEE are seen in the Atlantic and gulf coast states. EEE is the most serious of the arboviruses that can affect the central nervous system (CNS), resulting in severe complications and even death. Symptoms may range from none at all, to flu-like, to more serious infections with sudden fever and

severe headache, followed by seizures and coma. About one third of infected patients die, and of those who survive, many suffer permanent CNS damage. The primary vector is *Culiseta melanura*, which feeds only on birds. There are other vectors that spread the virus to other mammals, including various *Culex* and *Aedes species*.

St. Louis encephalitis (SLE) is transmitted from birds to mammals by an infected mosquito. SLE was discovered in 1933 in St. Louis, Mo. Since then, SLE has been reported in 46 states. Most infections of SLE do not result in illness, with mild cases exhibiting aseptic meningitis, or fever. The elderly and very young children are more susceptible, with fatality rates from 2 to 20 percent, and neurologic dysfunction occurring in about 1 percent of survivors. Nineteen human cases were reported in North Dakota from 1964 to 2010.

The California serogroup is a group of related viruses that include California encephalitis, La Crosse encephalitis, and Jamestown Canyon virus. Each year, about 75 cases are reported in the United States, with the majority of illnesses resulting from La Crosse encephalitis. The California serogroup viruses primarily affect children younger than 16 and more often infect males, than females. Infections are mild, with a mortality rate of about four deaths per 1,000 infections. Severe cases of La Crosse virus can affect the nervous system resulting in seizures, partial paralysis, and mental issues. The La Crosse virus is seen in a mosquito-small rodent-mosquito cycle, with spillover into the human population, with humans being the “dead end” host. Examples of small rodents include chipmunks and squirrels. The virus is generally seen in mosquitos from heavily wooded areas. The female *Aedes triseriatus*, *can pass the virus to the eggs she lays. This virus can remain dormant through the winter and develop into infected mosquitos in the spring.* The California serogroup viruses are not considered a major agricultural or public health threat in North Dakota.

Zika virus is the arbovirus of most recent concern. For the first time, outbreaks in the Western Hemisphere were reported in 2015. Local transmission was seen in Central and South America, the Caribbean, and Mexico. In 2016, the first case of local transmission was reported in the United States. The primary vectors of the Zika virus are *Aedes aegypti* and *Aedes albopictus*, neither of which is known to be present in the Midwest. Zika remains as a concern as it is known to have human to human transmission. Local outbreaks may occur as a result of the virus being transported by infected travelers. Symptoms of Zika virus include: fever, rash, joint pain, conjunctivitis, and may include muscle pain and headache. An infection with Zika virus during pregnancy has been linked to the birth defect, such as microcephaly, defects of the eye, hearing deficits, as well as growth impairments. There also appears to be a connection between the Zika virus and increased incidents of Guillain-Barré syndrome. Additional information about Zika virus can be found on the CDC website.

North Dakota Mosquito Surveillance Risk Assessment Chart for Arbovirus Activity

Risk Category	Probability of Human Outbreak	Definition of Conditions	Recommended Response by Mosquito Surveillance Team and North Dakota Vector Control Personnel
1a	Remote	Mid-season; first week of July; no observed epizootic activity; low population counts of vector species from New Jersey trap network	Begin preliminary, low-intensity CDC live-trapping network and testing in all areas of the state; test for targeted virus presence
1b		Late-season; third week of July through September; no observed epizootic activity; high population counts from New Jersey trap network	Deploy mid-intensity CDC live-trapping network and viral testing in areas with high population counts of targeted vector species; continue low-intensity trapping and testing in other areas
2	Low	Sporadic epizootic activity in birds or mosquitoes	Deploy high-intensity CDC live-trapping network and viral testing in epizootic areas, and consider preliminary control measures such as source reduction and larval control; continue surveillance in other areas
3	Moderate	Initial confirmation of virus in horse or human; moderate activity in birds or mosquitoes	Continue as in Category 2; consider adult mosquito control as indicated by surveillance activity
4	High	Measures suggesting high risk of human infection (for example, high dead bird densities, high mosquito infection rates, multiple positive mosquito species, horse or mammal cases indicating escalating epizootic transmission, or a human case)	Response as in Category 3; initiate adult mosquito control program in areas of potential human risk
5	Outbreak in progress	Multiple confirmed human cases; conditions as listed in Category 4	Implement emergency adult mosquito control program; if widespread, consider aerial spraying

Appendix A

New Jersey Mosquito Trap Data Analysis

The mosquito's life cycle has four separate and distinct stages: egg, larva, pupa and adult. A female mosquito breeds in the presence of water and lays fertile eggs after obtaining a blood meal. The location in which a female mosquito deposits her eggs in the environment depends upon larval habitat preference. The 34 mosquito species indigenous to North Dakota can be grouped into four that reflect their larval habitat preference; permanent pool, the transient water, the floodwater, and the artificial container and tree-hole.

Mosquitoes within the **permanent pool group**, *Anopheles* and *Culex* species, lay eggs either singly or side by side on the water surface of permanent ponds and lakes. Permanent pool mosquitoes can develop continuously in warm water and hatch daily into adults. **Transient water mosquitoes**, such as *Culex tarsalis*, prefer to lay their eggs in pools of a temporary nature. Common habitats of the transient water group are roadside ditches, canals, ground pools and irrigated lands. Transient water mosquito eggs found in ditches and small depressions must wait until rainfall to begin the hatching process. **Floodwater mosquitoes**, the *Aedes* species, lay eggs singly on damp soil or along vegetated shorelines; the eggs remain dormant until these areas are flooded. Once flooded, the eggs hatch if conditions are favorable. Large numbers of larvae emerge, and adults can appear as early as six days after flooding. A major rainstorm, a series of showers, or irrigation sufficient enough to produce standing water promotes hatching in the floodwater species of mosquitoes. The **artificial container and tree-hole group of mosquitoes** place their eggs inside the wall of a container or depression inside a tree, at or above the water line, and the eggs hatch when the water levels rise. A heavy rain resulting in standing water in areas such as old tires, tin cans and flowerpots, will begin the hatching process for artificial container mosquitoes.

Once hatched, larvae of all species emerge and live in water. After four stages, or instars, the larva molts into a pupa. The pupa stage is a resting, non-feeding stage, where the pupa is encased until the adult matures and emerges from the skin after one-and-a-half to four days. Adult male mosquitoes hatch first and live from six to seven days. Female mosquitoes can live for about two weeks, but have been found to survive for up to five months with ample food. Peak adult mosquito populations usually appear within two weeks after a number of eggs hatch.

Along with increased rainfall, warmer water temperatures speed up hatching and larval development. If outdoor temperatures are 50 degrees or higher, productive breeding sites readily produce mosquito larvae. With increasing water temperatures, large mosquito populations can emerge within one week. Research in laboratory settings has shown that if the water temperature exceeds 100 degrees, it takes only three to four days for larval metamorphosis; if the temperature is 90 degrees, it takes five days; and a lower water temperature of 70 degrees decreases rate of growth to 10 days. Floodwater species of *Aedes* larvae generally metamorphose within five to seven days after hatching. The species *Culex tarsalis* completes its life cycle in 14 days at 70 degrees and in only 10 days at 80 degrees. On the other hand, some species have naturally adapted to go through their entire life cycle in as little as four days or as long as one month.

When a mosquito becomes an adult, the weather elements affect its peak activity. Most mosquitoes are active from dusk until dawn when wind speeds are less than eight miles per hour, the air temperature is between 65 and 80 degrees, and the weather is moderate.

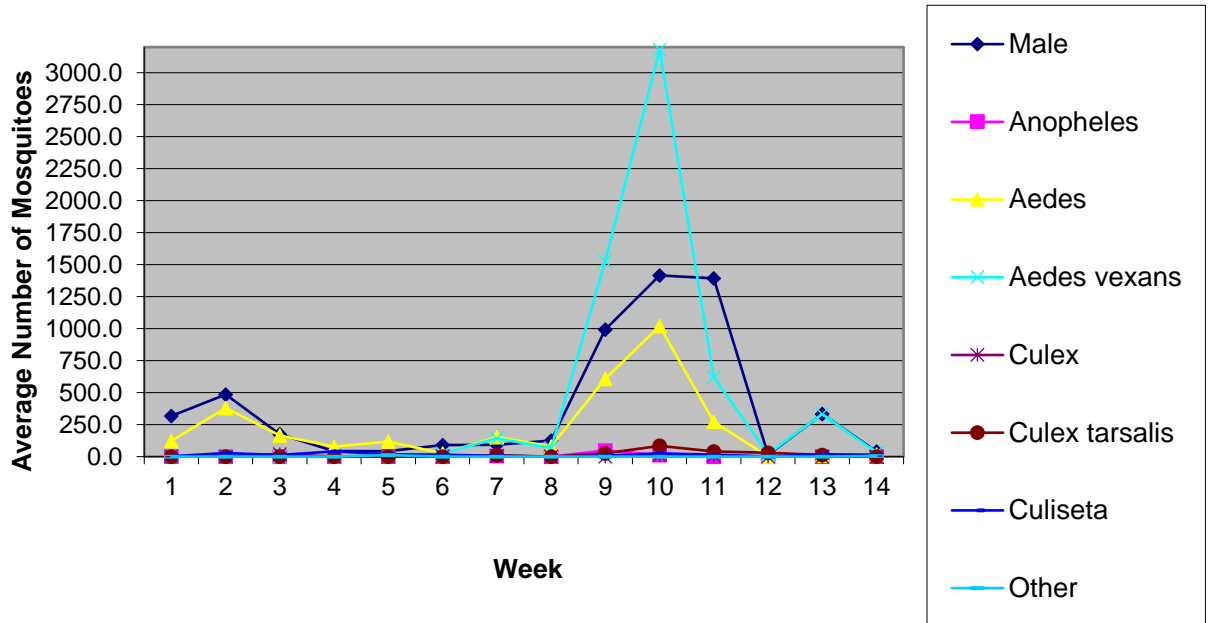
Heavy rains, gusting winds, and cool or high daytime temperatures all limit a mosquito's feeding activity. At temperatures lower than 50 degrees, mosquitoes become sluggish, reducing their host-seeking behavior. At higher temperatures, usually during daytime hours, adult mosquitoes seek cover in vegetated or humid areas with shade.

Region I

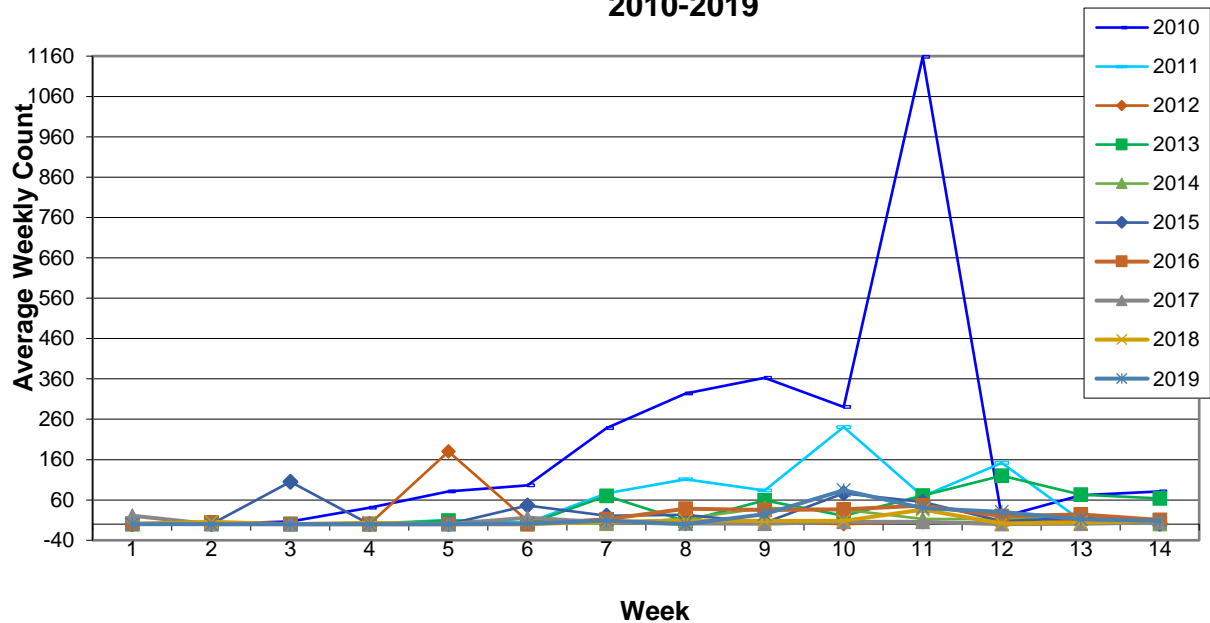
North Dakota Mosquito Surveillance

New Jersey Mosquito Trap Data Analysis

Region I Trap Averages



Region I Average Weekly Counts of Female *Culex tarsalis*: 2010-2019

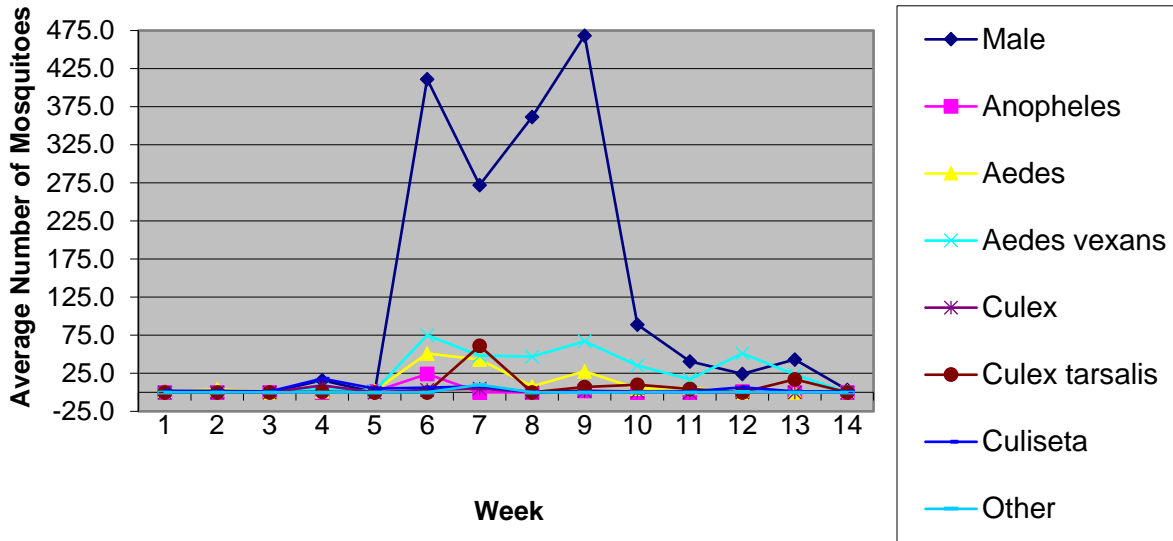


Region II

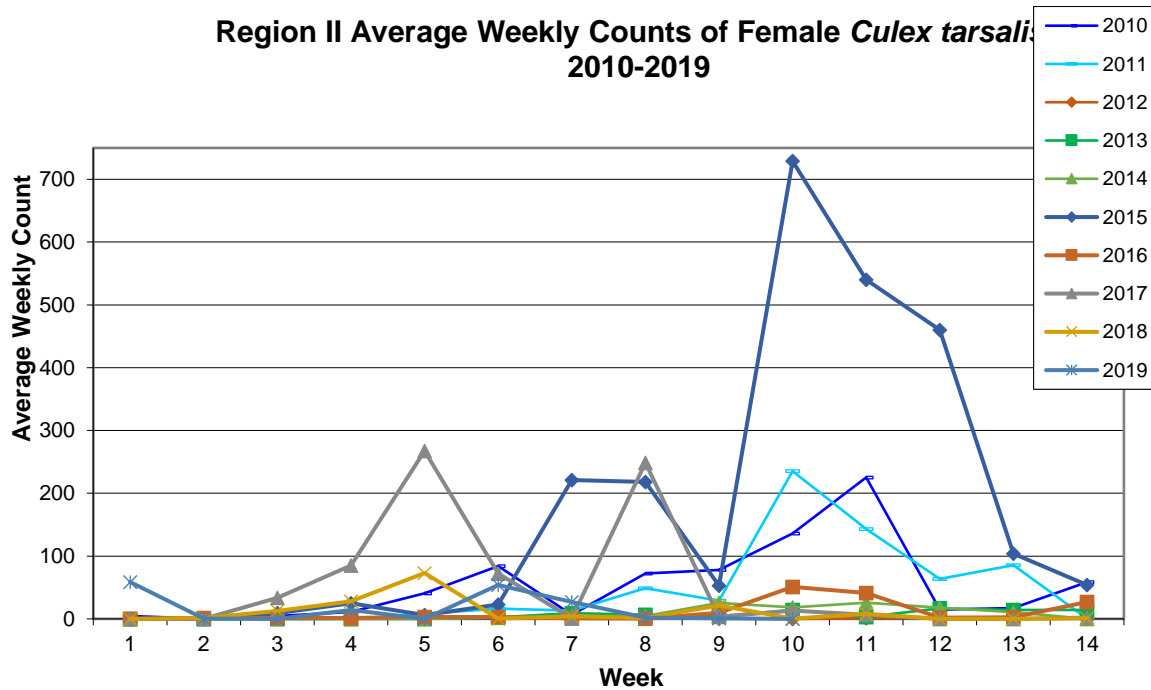
North Dakota Mosquito Surveillance

New Jersey Mosquito Trap Data Analysis

Region II Trap Averages

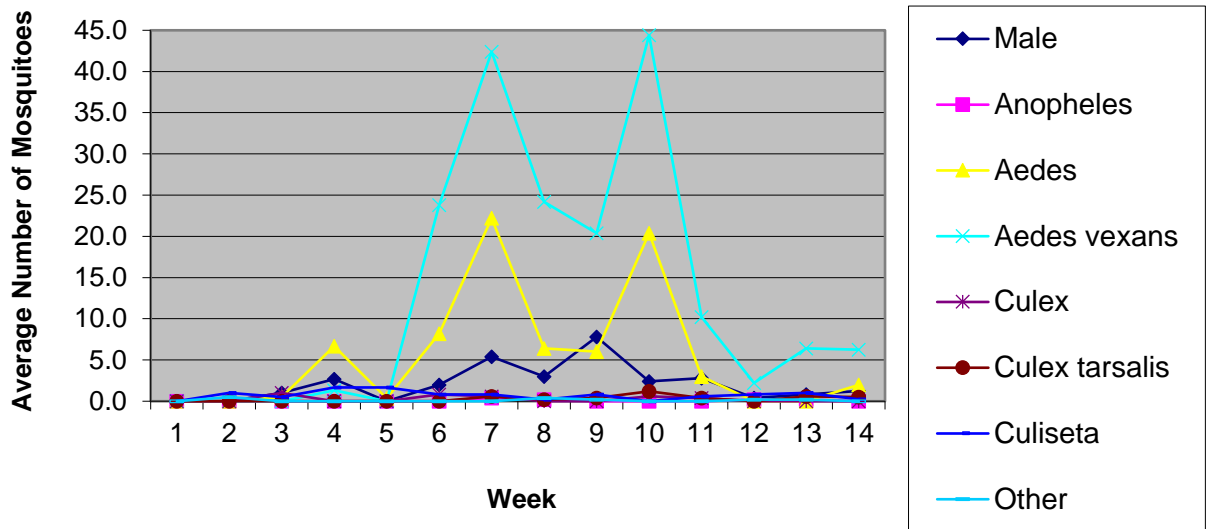


Region II Average Weekly Counts of Female *Culex tarsalis* 2010-2019

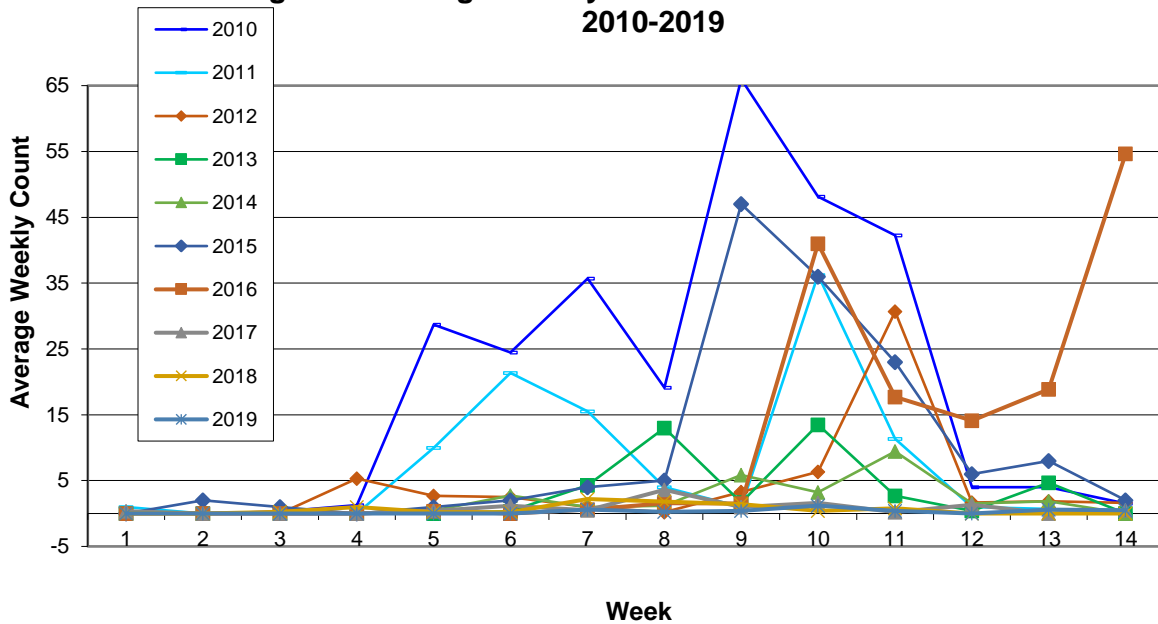


Region III North Dakota Mosquito Surveillance New Jersey Mosquito Trap Data Analysis

Region III Trap Averages



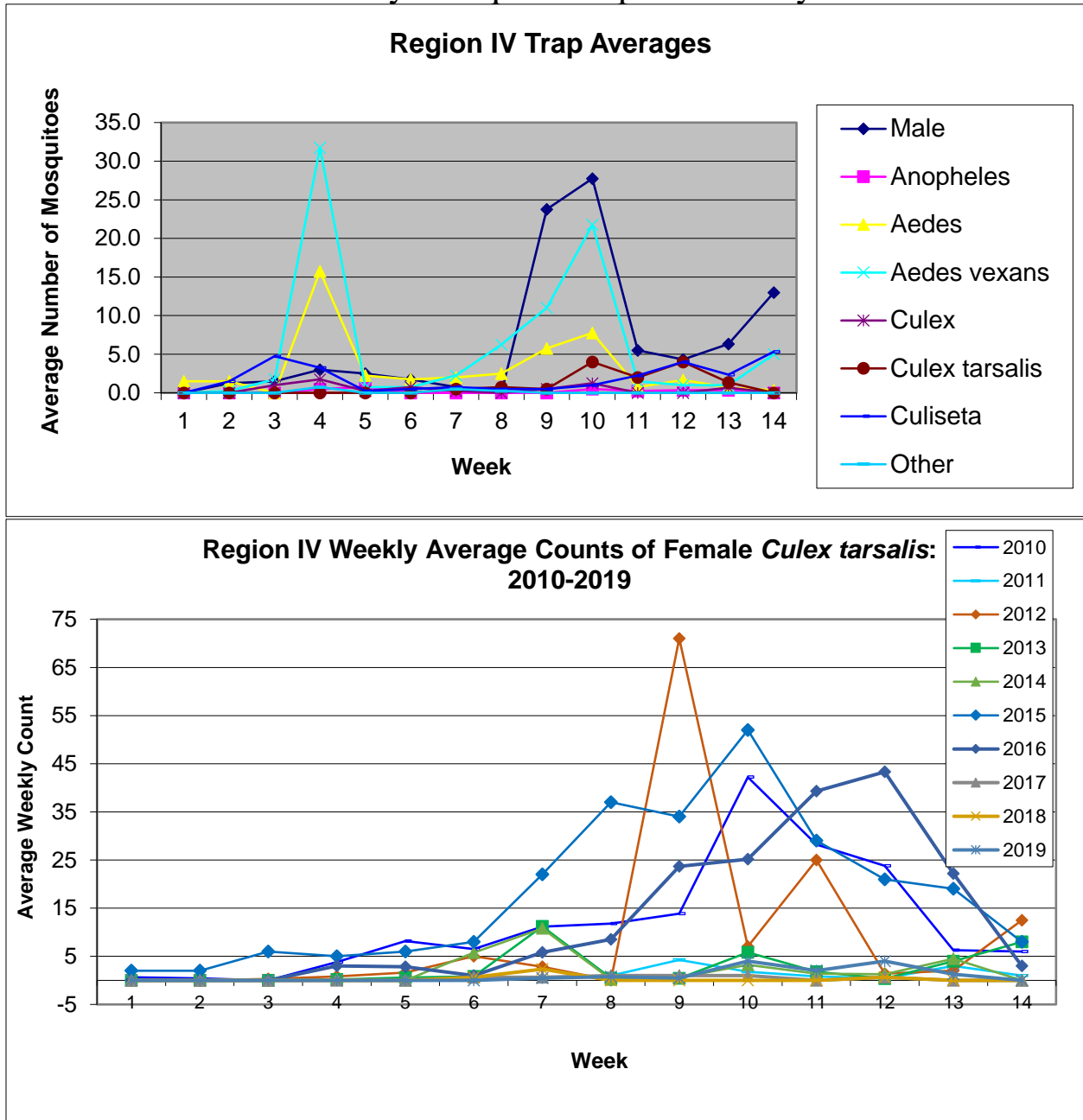
**Region III Average Weekly Counts of Female *Culex tarsalis*:
2010-2019**



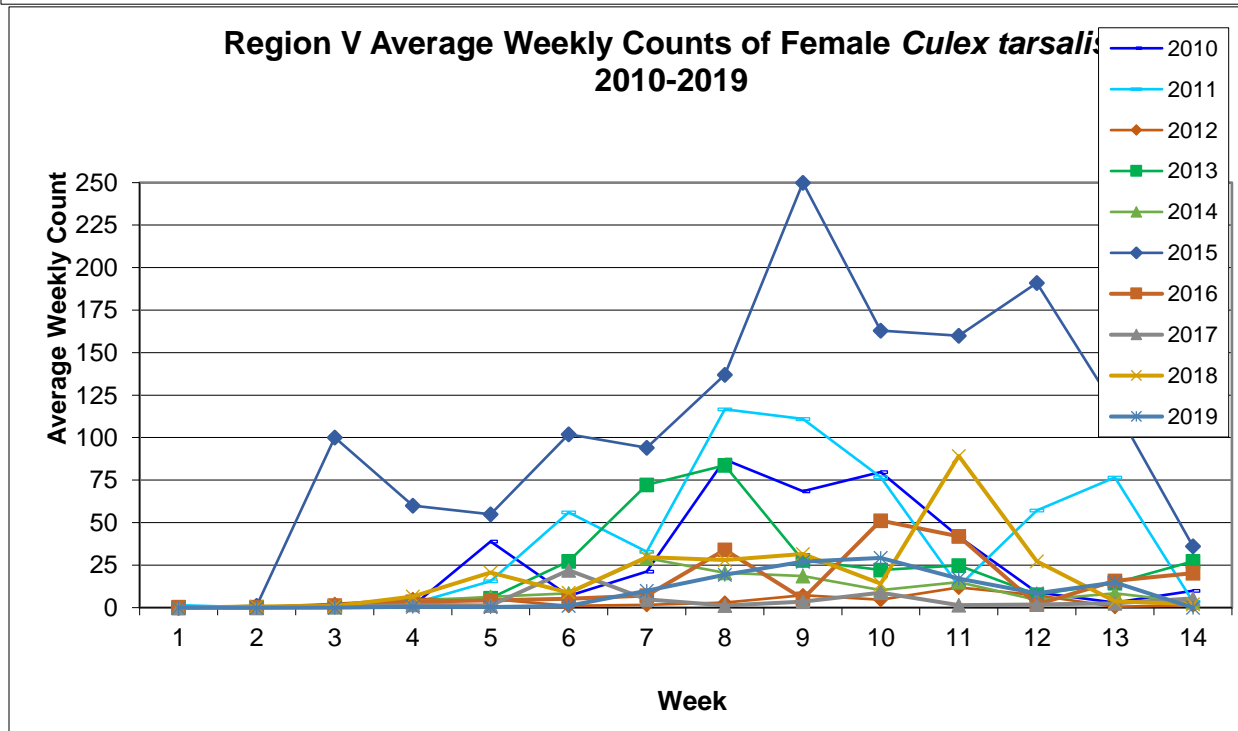
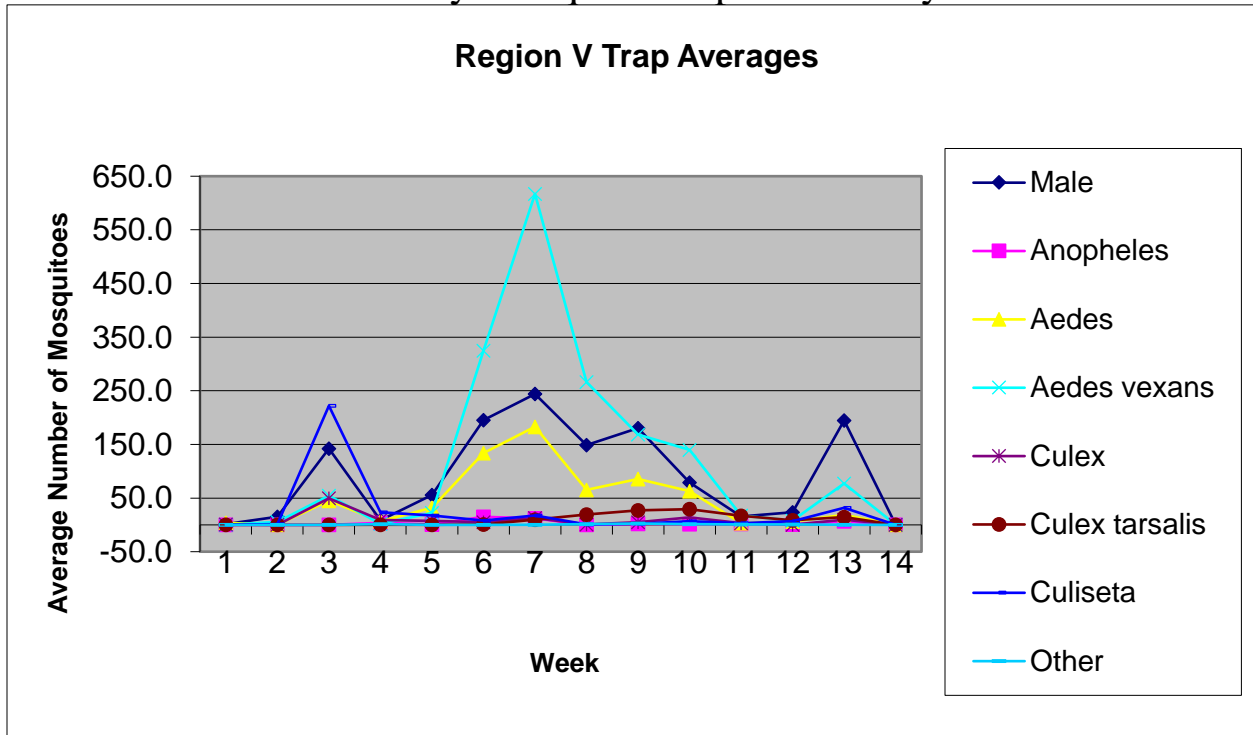
Region IV

North Dakota Mosquito Surveillance

New Jersey Mosquito Trap Data Analysis



Region V
North Dakota Mosquito Surveillance
New Jersey Mosquito Trap Data Analysis

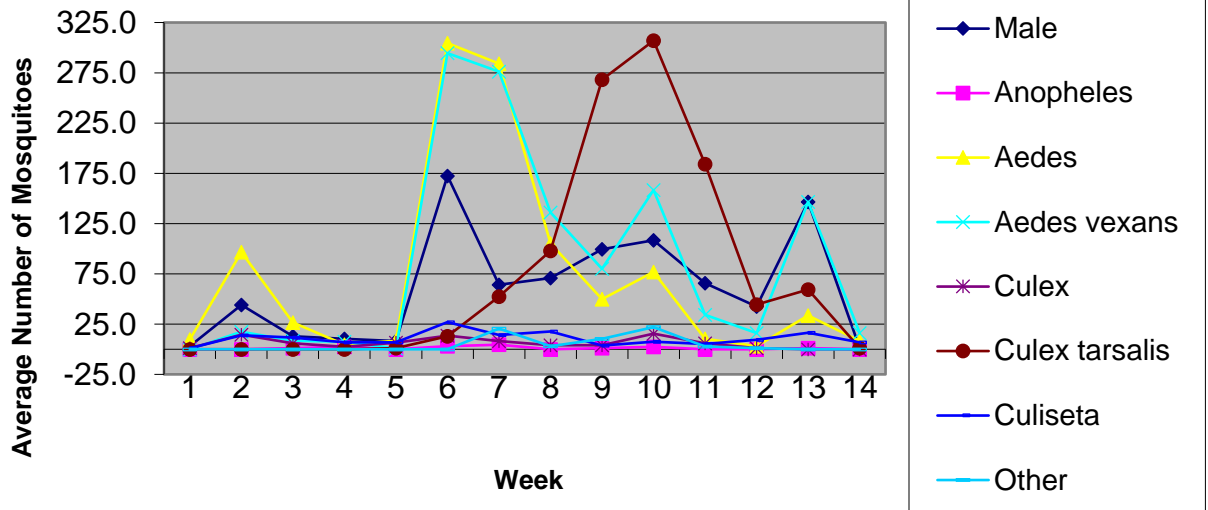


Region VI

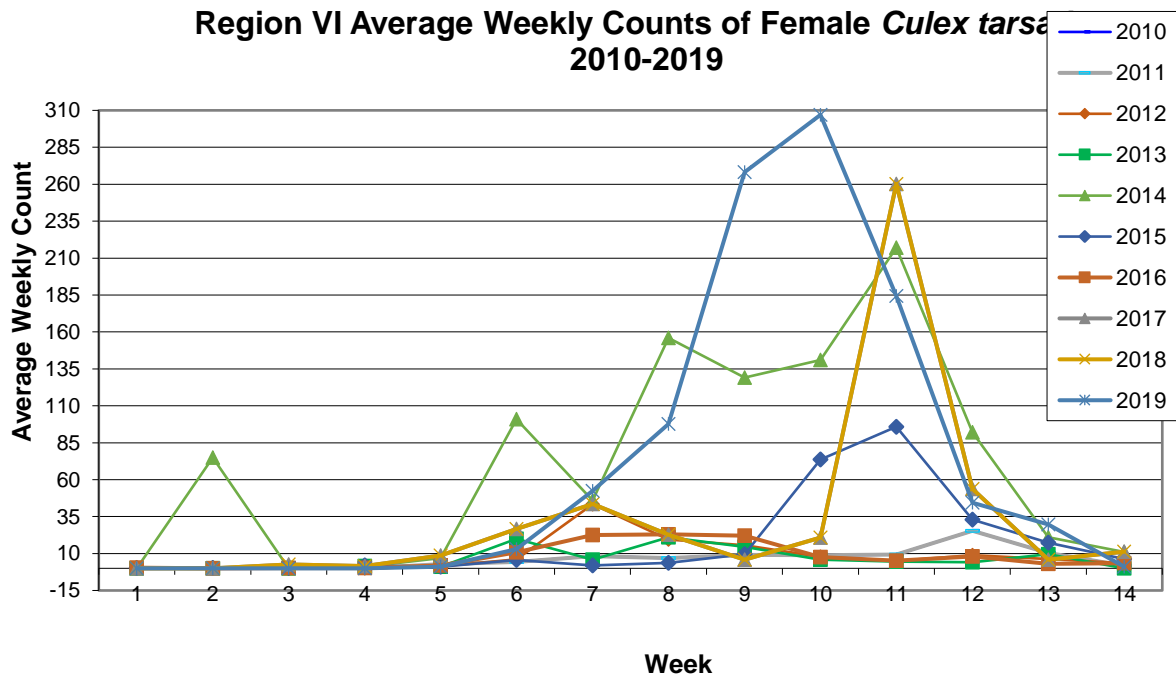
North Dakota Mosquito Surveillance

New Jersey Mosquito Trap Data Analysis

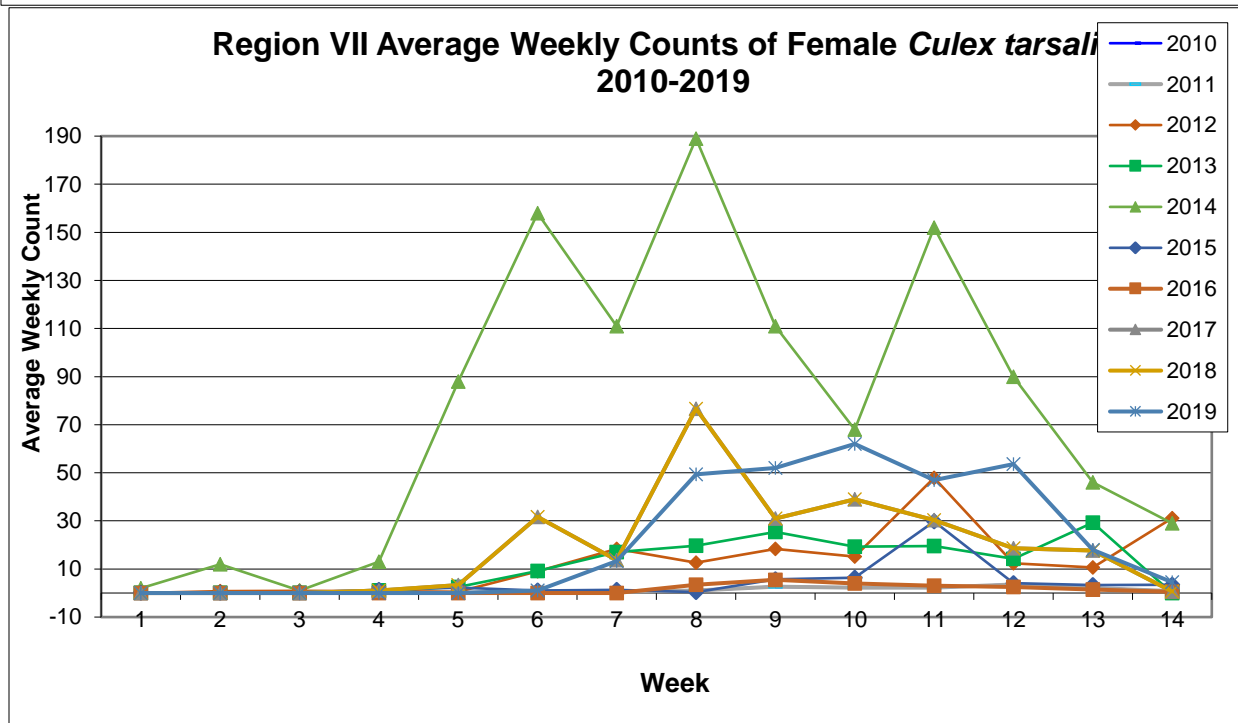
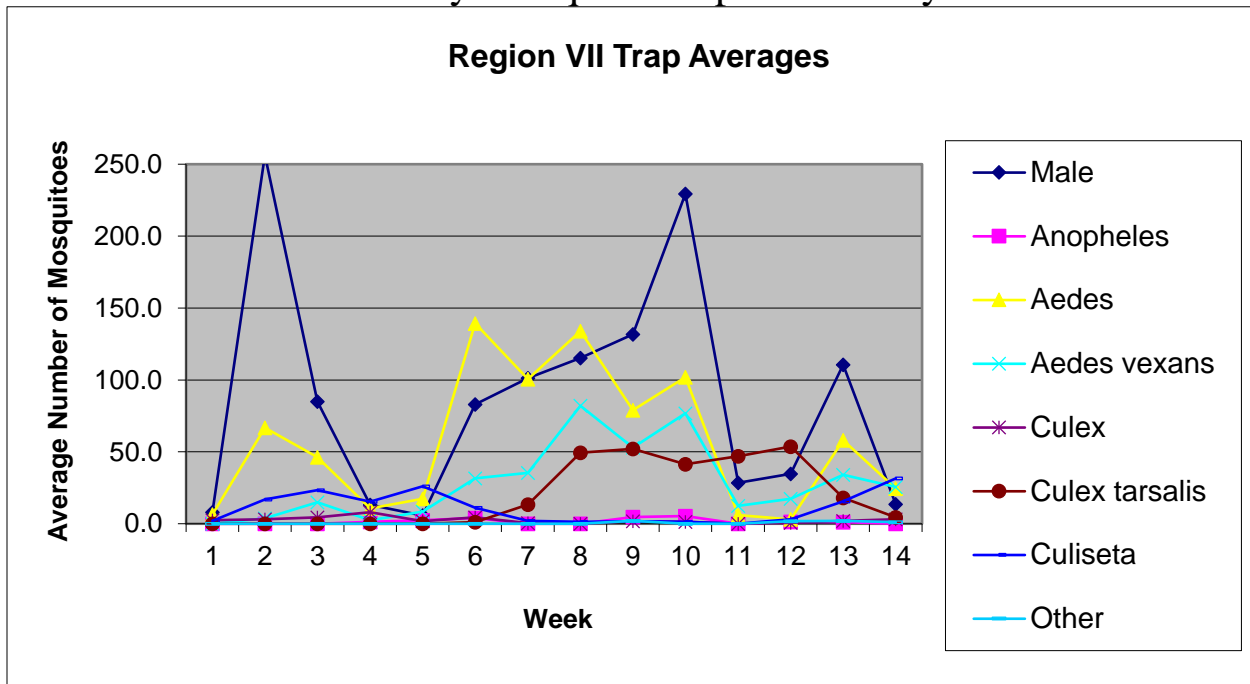
Region VI Trap Averages



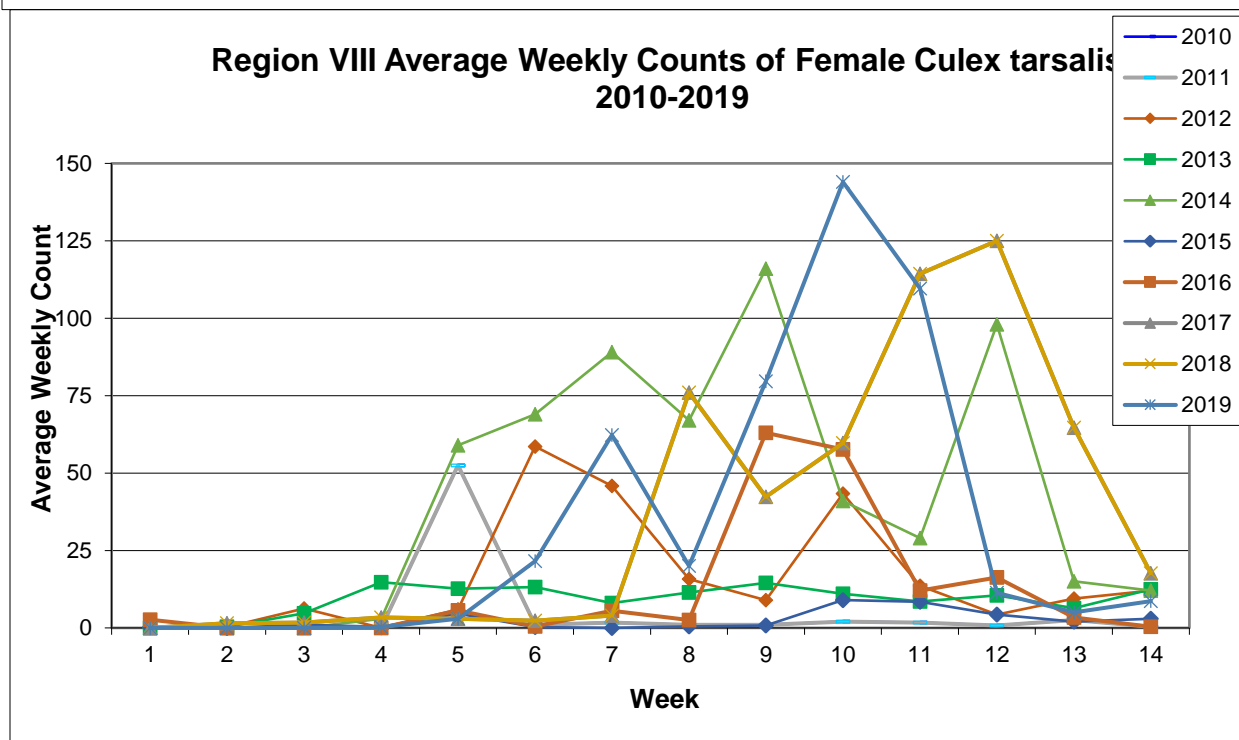
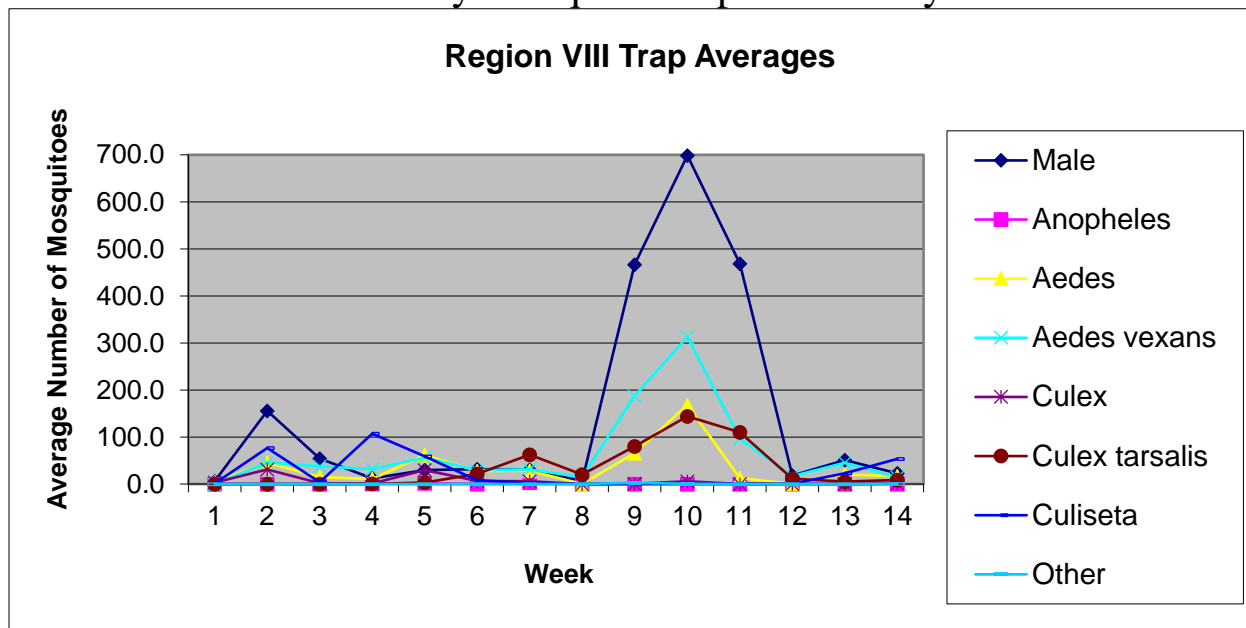
Region VI Average Weekly Counts of Female *Culex tarsalis* 2010-2019



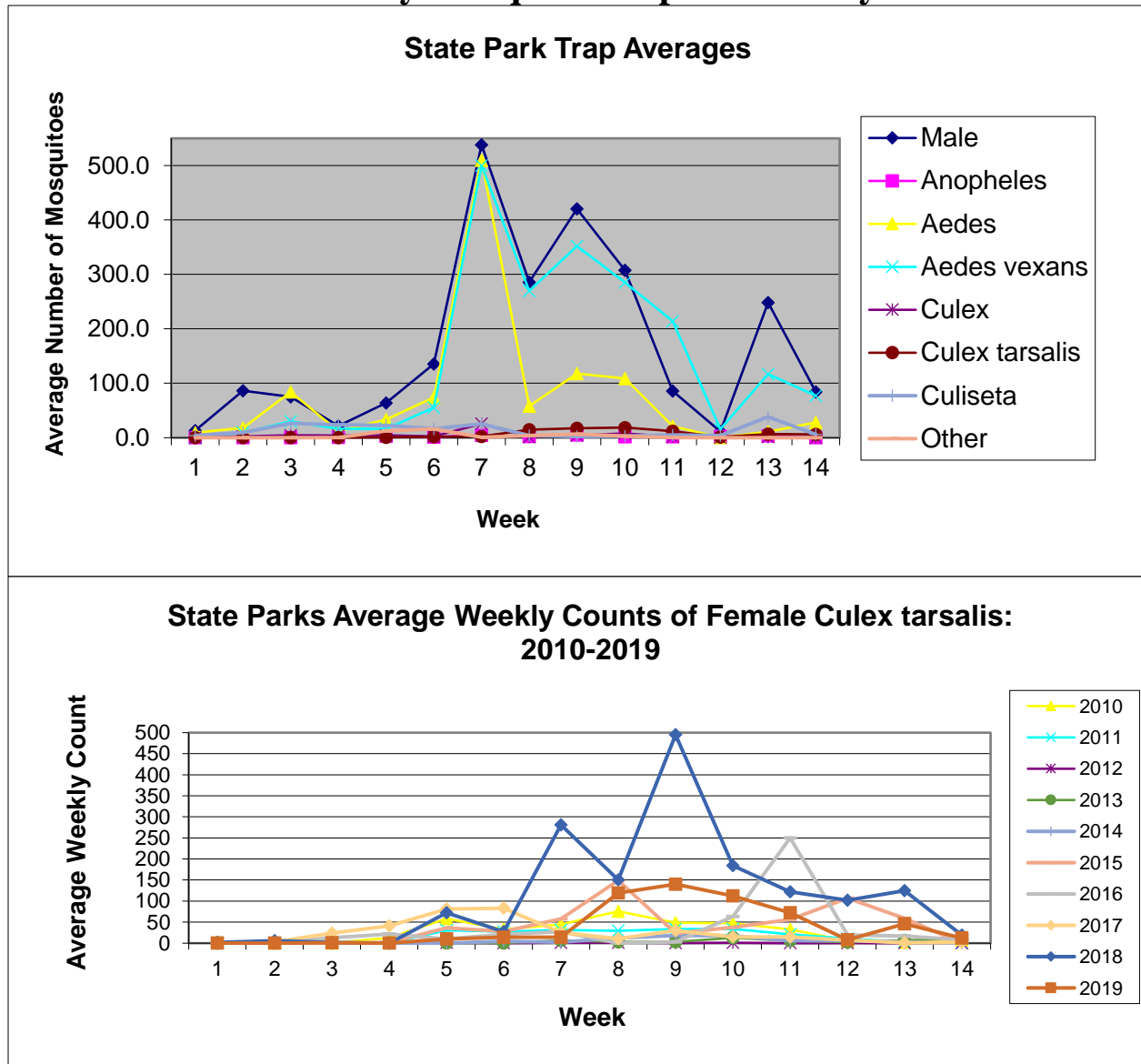
Region VII North Dakota Mosquito Surveillance New Jersey Mosquito Trap Data Analysis



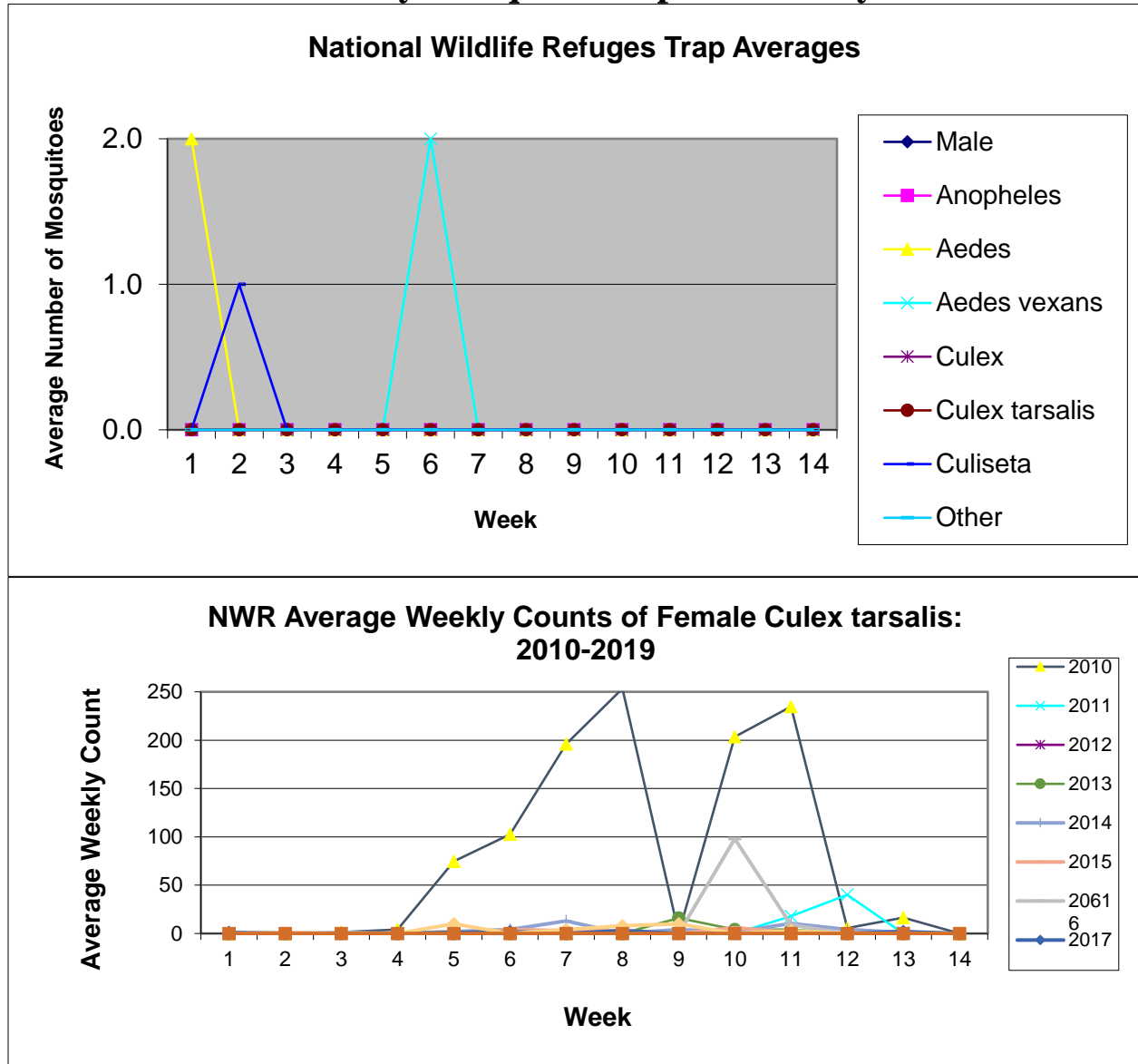
Region VIII North Dakota Mosquito Surveillance New Jersey Mosquito Trap Data Analysis



State Parks North Dakota Mosquito Surveillance New Jersey Mosquito Trap Data Analysis



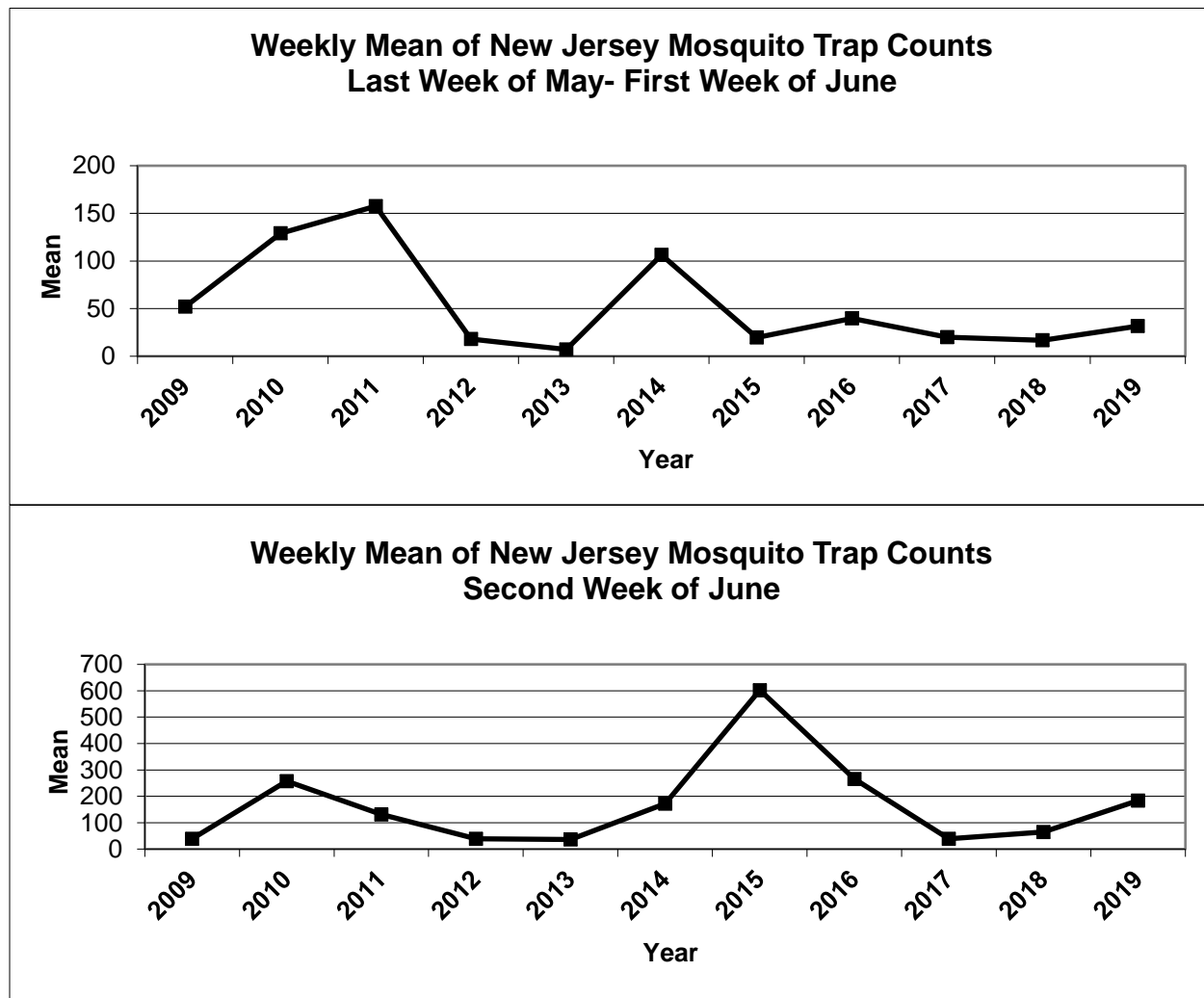
National Wildlife Refuges North Dakota Mosquito Surveillance New Jersey Mosquito Trap Data Analysis



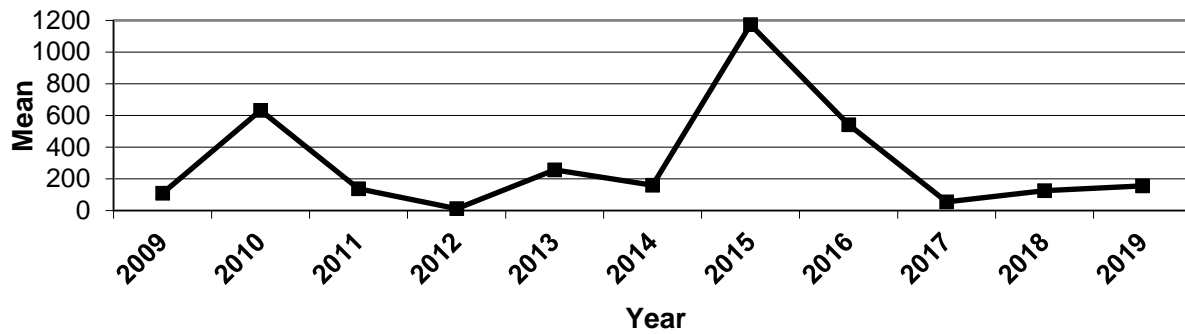
Appendix B 2010-2019

Weekly New Jersey Mosquito Trap Counts Comparison

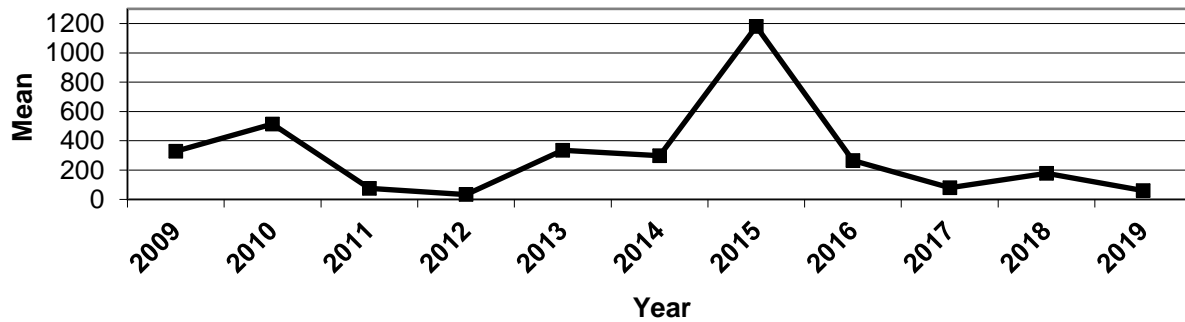
Appendix B includes graphs of the annual trap counts from the last week of May through the first week of September. These graphs depict how the mosquito trap counts have changed between 2010 and 2019. Each year, the general trend of North Dakota's mosquito population is a steady rise in population that peaks in early to late July, followed by a gradual decrease through the rest of the mosquito season. Yearly and weekly variances in trap numbers can be attributed to factors such as rainfall, temperature and wind speed.



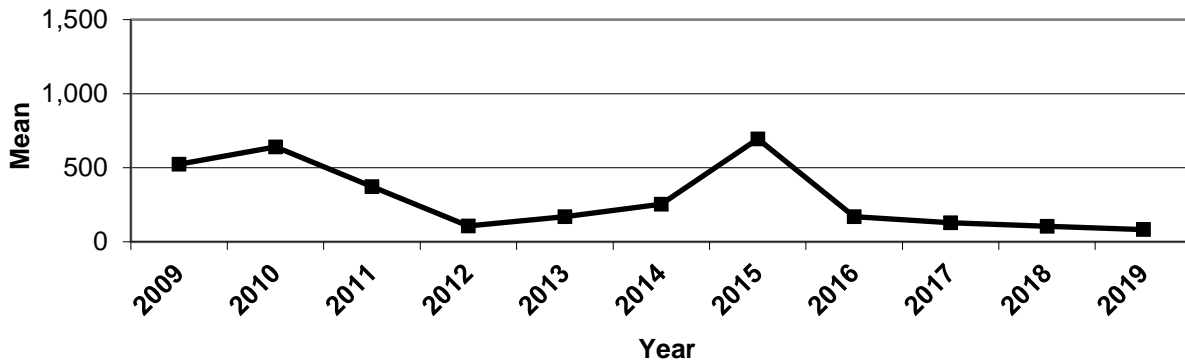
**Weekly Mean of New Jersey Mosquito Trap Counts
Third Week of June**



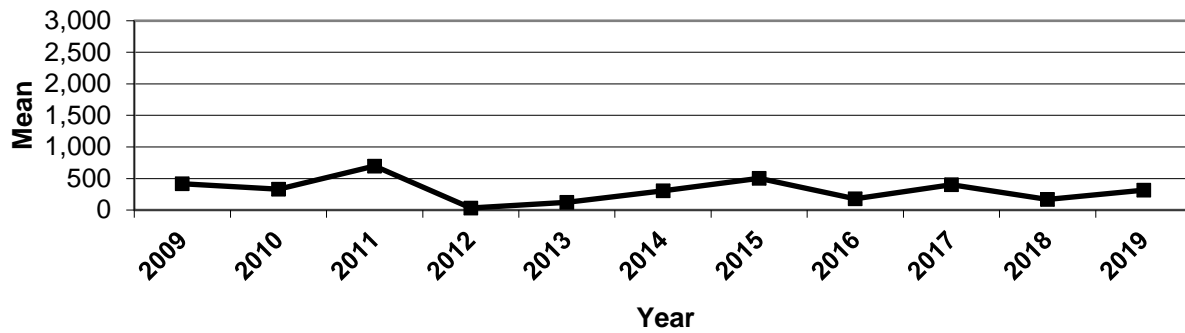
**Weekly Mean of New Jersey Mosquito Trap Counts
Fourth Week of June**



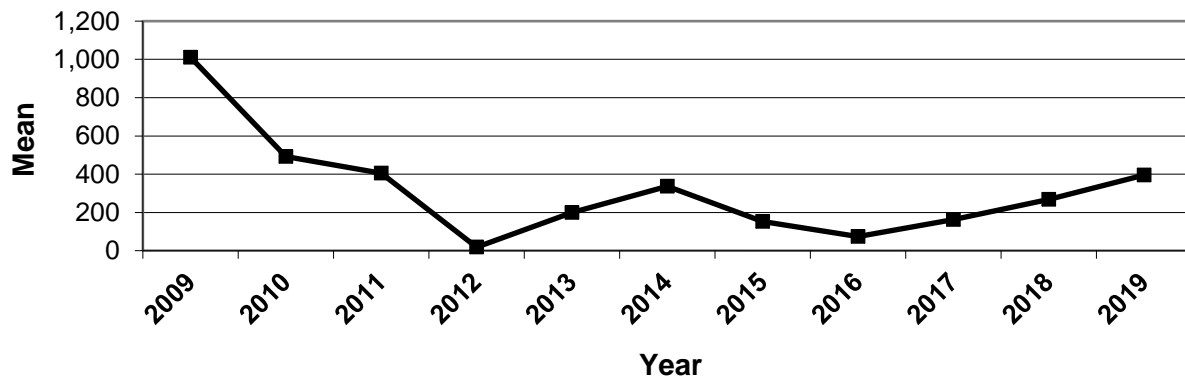
**Weekly Mean of New Jersey Mosquito Trap Counts
Fifth Week of June - First Week of July**



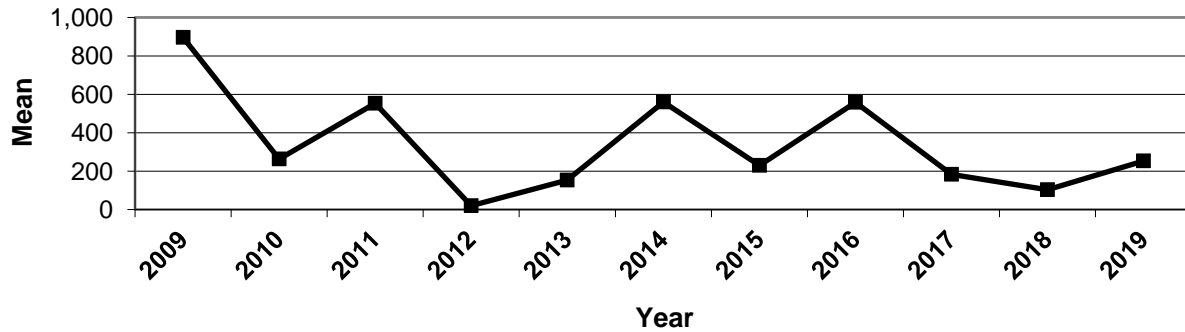
**Weekly Mean of New Jersey Mosquito Trap Counts
Second Week of July**



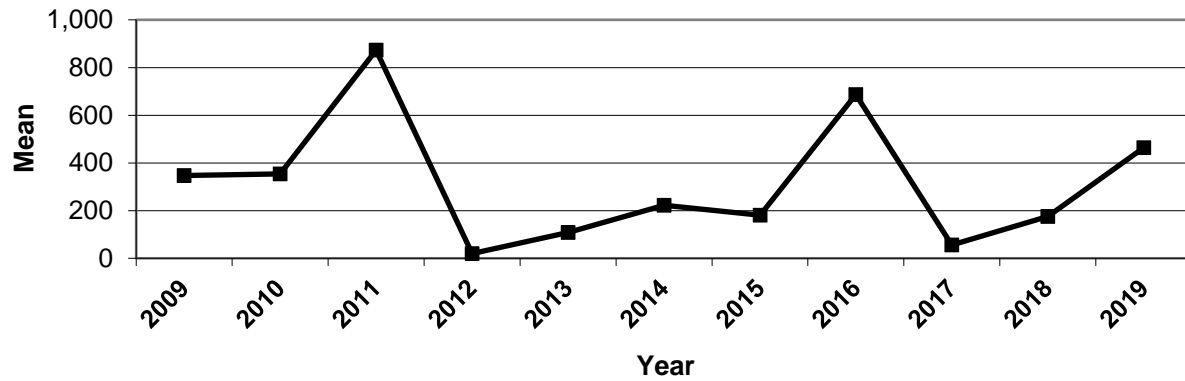
**Weekly Mean of New Jersey Mosquito Trap Counts
Third Week of July**



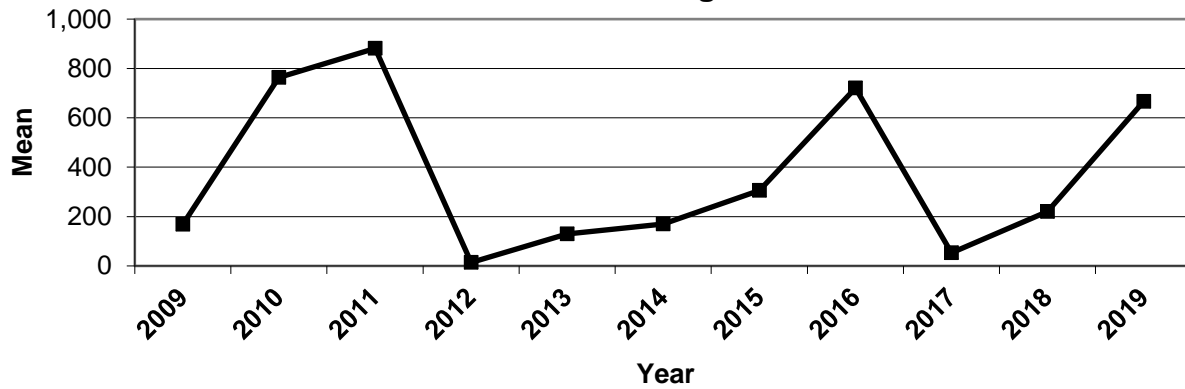
**Weekly Mean of New Jersey Mosquito Trap Counts
Fourth Week of July**



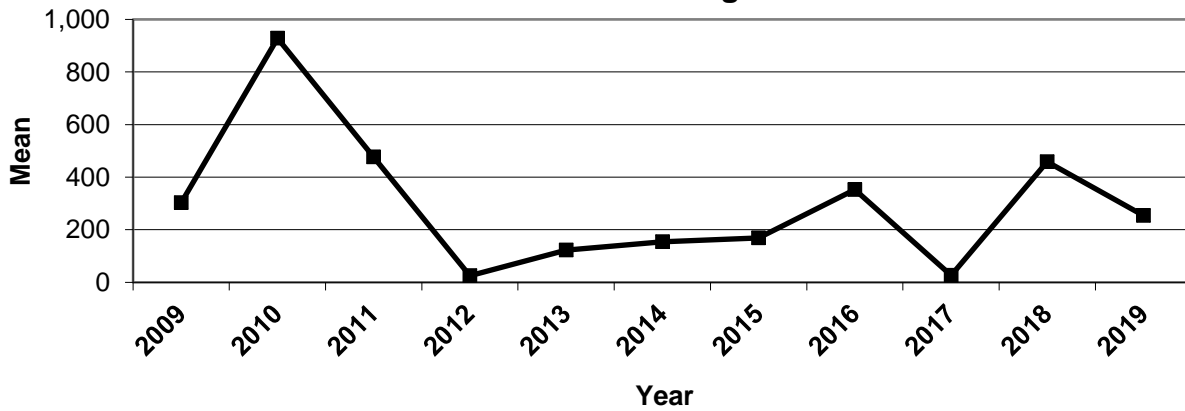
**Weekly Mean of New Jersey Mosquito Trap Counts
Fifth Week of July**



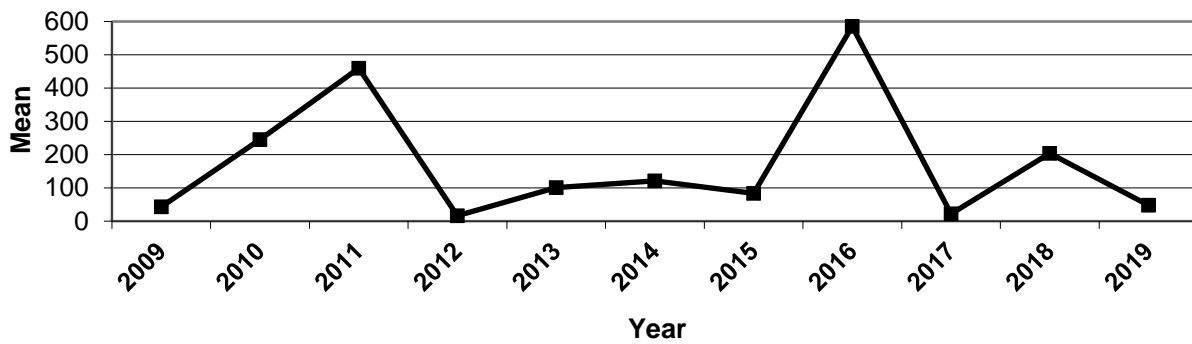
**Weekly Mean of New Jersey Mosquito Trap Counts
First Week of August**



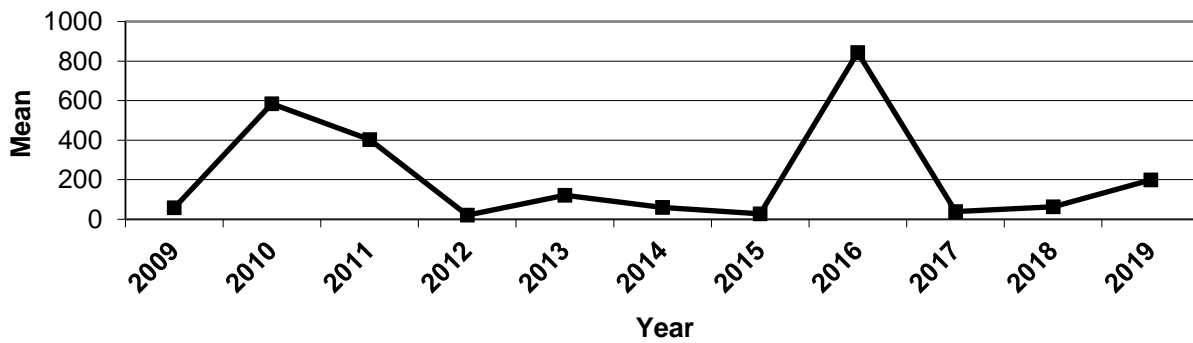
**Weekly Mean of New Jersey Mosquito Trap Counts
Second Week of August**



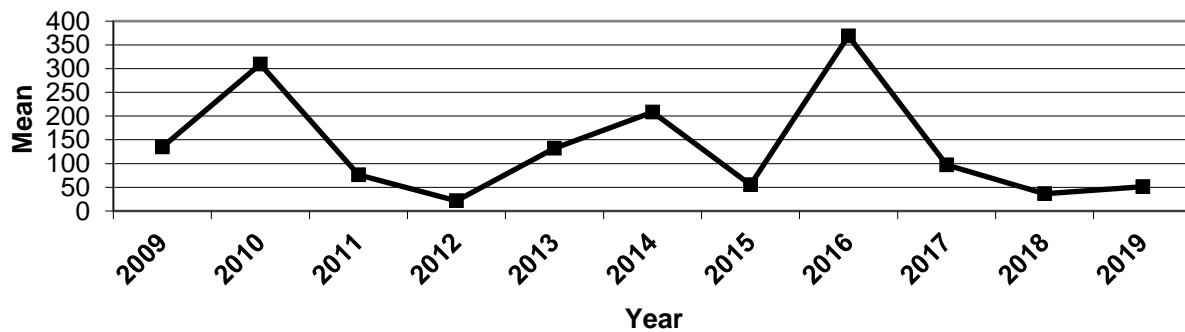
**Weekly Mean of New Jersey Mosquito Trap Counts
Third Week of August**



**Weekly Mean of Trap Counts
Fourth Week of August**



**Weekly Mean of Trap Counts
Fifth Week of August - First Week of September**



Appendix C: 2018 Weekly Live Trapping Mosquito Counts and PCR Results

Appendix C includes the weekly enumeration of the *Culex* spp., *Aedes* spp., and *Anopheles/Culiseta* spp. From the last week of May through the first week of September. Also included are the PCR results of the seven viruses tested: West Nile Virus, La Cross Encephalitis, Western Equine Encephalitis, Eastern Equine Encephalitis, Jamestown Canyon Virus, St. Louis Encephalitis, and Zika Virus.

Live Trapping Mosquito Counts 2019											
Week: 1 Dates: May 27 - June 2											
			Aedes spp.			Culex spp.			Anopheles/Culiseta spp.		
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culiseta spp.	PCR Results
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #1	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	5		0	0		0	0	
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #2	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	1		0	0		0	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2									
Total Mosquitos in Trap	Total Counts										

			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.		
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	7		0	0		0	0	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	0	10	Negative	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	10		0	0		0	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	0	75	Negative	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	75		0	0		0	4	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	0	13	Negative	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	13		0	0		0	3	
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.		
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		4	4		0	1		0	4	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot#2									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	1		0	0		0	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	0		0	0		0	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	5		0	2		0	5	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	0	26	Negative	3	0	Negative	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	26		3	0		0	1	
# of Mosquitos Tested for PCR	McLean (Region VII)	White Shield	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	0		0	0		0	0	
# of Mosquitos Tested for PCR	Montrail (Region II)	Parshall	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	1		0	0		0	2	
*Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus											

	Live Trapping Mosquito Counts 2019										
	Week: 2 Dates: June 3 - June 9										
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.		
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	PCR Results
# of Mosquitos Tested for PCR	Burlleigh (Region VII)	Bismarck #1	100	100	Negative	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		394	412		0	0		0	5	
# of Mosquitos Tested for PCR	Burlleigh (Region VII)	Bismarck #2	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		4	0		0	0		0	5	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1	0	100	Negative	0	0	Not Tested	0	100	Negative
Total Mosquitos in Trap	Total Counts		0	134		0	0		0	134	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	3		0	0		0	0	
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.		
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	0	38	Negative	0	0	Not Tested	0	12	Negative
Total Mosquitos in Trap	Total Counts		0	38		0	0		0	12	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	0	45	Negative	0	0	Not Tested	0	84	Negative
Total Mosquitos in Trap	Total Counts		0	45		0	0		0	84	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	8		0	1		0	5	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	0	10	Negative	0	0	Not Tested	0	11	Negative
Total Mosquitos in Trap	Total Counts		0	10		0	0		0	11	

			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.		
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Ward (Region II)	Minot#2									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	12	0	Negative	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		12	0		0	0		0	1	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	7		0	0		0	1	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	0	43	Negative	2	0	Negative	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	43		2	0		0	1	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	100	17	Negative	5	0	Negative	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		194	17		5	1		0	5	
# of Mosquitos Tested for PCR	McKenzie (Region I)	South of Mandaree	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	0		0	0		0	0	
# of Mosquitos Tested for PCR	McKenzie (Region I)	Mandaree	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		1	3		0	0		0	1	
*Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus											

	Live Trapping Mosquito Counts 2019										
	Week: 3 Dates: June 10 - June 16										
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.		
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	PCR Results
# of Mosquitos Tested for PCR	Burlcigh (Region VII)	Bismarck #1	91	9	Negative	2	0	Negative	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		1108	122		2	0		0	6	
# of Mosquitos Tested for PCR	Burlcigh (Region VII)	Bismarck #2	97	3	Negative	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		2282	104		0	0		3	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1	-	-	Not Tested	-	-	Not Tested	-	-	Not Tested
Total Mosquitos in Trap	Total Counts		36	6		0	0		0	1	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2	-	-	Not Tested	-	-	Not Tested	-	-	Not Tested
Total Mosquitos in Trap	Total Counts		72	21		0	0		0	2	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1	6	94	Negative	0	0	Not Tested	1	41	Negative
Total Mosquitos in Trap	Total Counts		6	97		0	0		1	41	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2	0	33	Negative	0	0	Not Tested	0	12	Negative
Total Mosquitos in Trap	Total Counts		0	33		0	0		0	12	
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.		
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	6		0	3		0	1	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	3	39	Negative	0	21	Negative	0	38	Negative
Total Mosquitos in Trap	Total Counts		3	39		0	21		0	38	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	-	-	Not Tested	-	-	Not Tested	-	-24	Not Tested
Total Mosquitos in Trap	Total Counts		20	2		0	3		0	38	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		1	2		0	0		0	4	

			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.		
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	66	34	Negative	0	0	Not Tested	0	44	Negative
Total Mosquitos in Trap	Total Counts		112	104		0	0		0	44	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot#2	47	20	Negative	0	0	Not Tested	28	17	Negative
Total Mosquitos in Trap	Total Counts		47	20		0	0		28	17	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		4	0		0	0		0	3	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		3	0		0	1		0	1	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	78	22	Negative	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		4004	648		0	0		0	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	100	0	Negative	2	0	Negative	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		3480	16		2	0		2	0	
# of Mosquitos Tested for PCR	McLean (Region VII)	White Shield									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Montrail (Region II)	Parshall									
Total Mosquitos in Trap	Total Counts										
*Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus											

Live Trapping Mosquito Counts 2019											
Week: 4 Dates: June 17 - June 23											
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.		
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	PCR Results
# of Mosquitos Tested for PCR	Burlleigh (Region VII)	Bismarck #1	65	35	Negative	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		409	205		0	0		1	1	
# of Mosquitos Tested for PCR	Burlleigh (Region VII)	Bismarck #2	67	2	Negative	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		67	2		0	0		1	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1	8	2	Negative	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		8	2		0	0		0	1	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	1		0	0		0	2	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2									
Total Mosquitos in Trap	Total Counts										
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.		
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2									
Total Mosquitos in Trap	Total Counts										
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	16	7	Negative	4	9	Negative	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		16	7		4	9		0	6	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	15	8	Negative	2	27	Negative	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		15	8		2	27		0	6	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	14	5	Negative	0	0	Not Tested	3	11	Negative
Total Mosquitos in Trap	Total Counts		14	5		0	0		3	11	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		2	0		0	0		0	1	

			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.		
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	-	-	Not Tested	-	-	Not Tested	-	-	Not Tested
Total Mosquitos in Trap	Total Counts		72	27		0	0		2	2	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot#2	24	1	Negative	0	0	Not Tested	88	1	Negative
Total Mosquitos in Trap	Total Counts		24	1		0	0		88	1	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		6	2		0	0		1	1	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	0	0	Not Tested	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	4		0	1		0	1	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	100	0	Negative	3	0	Negative	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		4332	200		3	0		0	5	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	37	63	Negative	4	0	Negative	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		972	1020		16	0		0	4	
# of Mosquitos Tested for PCR	Dunn (Region VIII)	Twin Buttes #1	52	48	Negative	2	0	Negative	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		59	55		2	0		3	4	
# of Mosquitos Tested for PCR	Dunn (Region VIII)	Twin Buttes #2	9	1	Negative	0	0	Not Tested	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		9	1		0	0		0	0	
*Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus											

Live Trapping Mosquito Counts 2019												
Week: 5 Dates: June 24 - June 30												
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #1	0	0	Not Tested	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		9	1		0	0		0	0	0	
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #2	9	2	Negative	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		9	2		0	0		0	4	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1	0	0	Not Tested	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	1		0	1		0	1	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2	0	0	Not Tested	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		5	0		0	0		0	2	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1	0	13	Negative	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	13		0	0		0	1	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2	30	9	Negative	0	0	Not Tested	1	45	0	Negative
Total Mosquitos in Trap	Total Counts		30	9		0	4		1	45	0	
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	52	48	Negative	12	37	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		53	49		12	37		0	7	0	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	7	10	Negative	0	19	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		7	10		0	19		0	0	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	0	0	Not Tested	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	0		0	2		0	0	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	0	0	Not Tested	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		2	0		0	0		0	0	1	

			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	33	15	Negative	0	0	Not Tested	1	22	0	Negative
Total Mosquitos in Trap	Total Counts		33	15		0	0		1	22	0	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #2	0	0	Not Tested	0	0	Not Tested	51	1	0	Negative
Total Mosquitos in Trap	Total Counts		1	6		0	0		51	1	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	1	16	Negative	3	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		1	16		3	2		0	3	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	0	0	Not Tested	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		1	5		1	2		0	1	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	95	5	Negative	55	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		95	5		55	0		0	6	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	90	10	Negative	3	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		896	112		3	0		1	3	0	
# of Mosquitos Tested for PCR	Dunn (Region VIII)	Twin Buttes #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Dunn (Region VIII)	Twin Buttes #2										
Total Mosquitos in Trap	Total Counts											

***Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus**

Live Trapping Mosquito Counts 2019												
Week: 6 Dates: July 1 - July 7												
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #1	0	0	Not Tested	3	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	0		3	0		0	0	0	
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #2	88	12	Negative	22	1	Negative	0	14	0	Negative
Total Mosquitos in Trap	Total Counts		438	44		22	1		0	14	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1	21	8	Negative	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		21	8		0	0		0	0	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2	90	10	Negative	7	1	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		266	27		7	1		0	8	0	
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	22	8	Negative	18	8	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		22	8		18	8		0	8	0	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	21	3	Negative	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		21	3		0	2		0	8	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	95	5	Negative	4	1	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		110	19		4	1		0	7	1	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	19	11	Negative	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		19	11		0	0		0	0	4	

			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	80	20	Negative	14	1	Negative	4	96	0	Negative
Total Mosquitos in Trap	Total Counts		101	24		14	1		4	101	0	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot#2	9	2	Negative	8	0	Negative	10	19	0	Negative
Total Mosquitos in Trap	Total Counts		9	2		8	0		10	19	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	90	10	Negative	26	4	Negative	1	10	0	Negative
Total Mosquitos in Trap	Total Counts		917	178		26	4		1	10	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	90	10	Negative	15	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		315	52		15	2		1	7	0	
# of Mosquitos Tested for PCR	McLean (Region VII)	White Shield										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Montrail (Region II)	Parshall										
Total Mosquitos in Trap	Total Counts											

***Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus**

Live Trapping Mosquito Counts 2019												
Week: 7 Dates: July 8 - July 14												
			Aedes spp.			Culex spp.			Anopheles/Culisetta/Coquillettidia spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #1	76	24	Negative	88	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		862	238		88	2		0	1	3	
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #2	97	3	Negative	4	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		3612	312		4	0		0	3	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1	31	10	Negative	31	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		31	10		31	0		0	0	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2	48	5	Negative	26	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		48	5		26	0		0	0	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1	84	16	Negative	100	0	Negative	0	16	0	Negative
Total Mosquitos in Trap	Total Counts		946	202		236	6		0	32		
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2	89	11	Negative	100	0	Negative	0	33	0	Negative
Total Mosquitos in Trap	Total Counts		1040	108		117	0		0	33	0	
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	14	5	Negative	98	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		14	5		149	2		0	0	5	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	6	9	Negative	38	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		6	9		38	0		0	0	1	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	66	23	Negative	39	25	Negative	1	12	15	Negative
Total Mosquitos in Trap	Total Counts		66	23		39	25		1	12	15	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	18	15	Negative	7	0	Negative	0	1	32	Negative
Total Mosquitos in Trap	Total Counts		18	15		7	0		0	1	32	

			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	93	7	Negative	4	2	Negative	5	9	29	Negative
Total Mosquitos in Trap	Total Counts		468	24		4	2		5	9	29	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot#2	92	8	Negative	23	0	Negative	94	4	2	Negative
Total Mosquitos in Trap	Total Counts		852	184		23	0		188	8	4	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	26	9	Negative	2	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		26	9		2	2		0	3	1	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	10	4	Negative	9	3	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		10	4		9	3		0	3	1	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	-	-	Not Tested	-	-	Not Tested	-	-	-	Not Tested
Total Mosquitos in Trap	Total Counts		1636	1128		212	56		0	12	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	-	-	Not Tested	-	-	Not Tested	-	-	-	Not Tested
Total Mosquitos in Trap	Total Counts		408	512		40	16		0	16	0	
# of Mosquitos Tested for PCR	McLean (Region VII)	White Shield										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Montrail (Region II)	Parshall										
Total Mosquitos in Trap	Total Counts											

***Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus**

Live Trapping Mosquito Counts 2019												
Week: 8 Dates: July 15 - July 21												
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #1	64	36	Negative	40	5	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		844	420		160	20		4	16	4	
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #2	15	85	Negative	4	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		868	140		16	4		0	24	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1	0	0	Not Tested	6	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		4	0		6	0		0	0	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1	77	23	Negative	16	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		1328	300		32	0		0	2	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2	77	23	Negative	82	0	Negative	0	24	0	Negative
Total Mosquitos in Trap	Total Counts		1250	248		82	0		0	24	0	
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	11	5	Negative	100	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		11	5		205	0		0	1	0	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	8	1	Negative	72	5	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		8	1		72	5		0	0	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	46	2	Negative	31	5	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		46	2		31	5		0	0	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	29	10	Negative	24	8	Negative	0	3	20	Negative
Total Mosquitos in Trap	Total Counts		29	10		24	8		0	3	20	

			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	85	15	Negative	17	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		1230	228		34	4		6	10	0	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot#2	78	22	Negative	46	7	Negative	55	3	2	Negative
Total Mosquitos in Trap	Total Counts		573	223		46	7		55	3	2	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	49	3	Negative	17	5	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		49	3		17	5		3	1	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	93	7	Negative	5	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		141	10		5	0		0	1	6	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	77	23	Negative	36	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		143	54		36	0		1	0	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	61	39	Negative	99	1	Negative	8	2	0	Negative
Total Mosquitos in Trap	Total Counts		484	232		306	14		8	2	0	
# of Mosquitos Tested for PCR	McLean (Region VII)	New Town	0	0	Not Tested	89	10	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	0		89	10		0	1	1	
# of Mosquitos Tested for PCR	Montrail (Region II)	Four Bears	22	3	Negative	26	2	Negative	16	1	0	Negative
Total Mosquitos in Trap	Total Counts		22	3		26	2		16	1	0	
*Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus												

Live Trapping Mosquito Counts 2019												
Week: 9 Dates: July 22 - July 28												
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #1	60	40	Negative	38	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		784	596		152	0		0	8	0	
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #2	63	37	Negative	23	7	Negative	5	26	3	Negative
Total Mosquitos in Trap	Total Counts		414	222		23	7		5	26	3	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1	9	4	Negative	73	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		9	4		73	0		0	0	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2	58	8	Negative	80	9	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		58	8		80	9		0	1	1	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1	100	0	Negative	29	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		252	0		29	0		0	1	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2	62	11	Negative	16	0	Negative	0	23	0	Negative
Total Mosquitos in Trap	Total Counts		62	11		16	0		0	23	0	
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	0	0	Not Tested	10	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	0		10	0		0	0	0	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	85	15	Negative	38	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		146	40		38	0		0	1	2	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	23	5	Negative	61	39	Positive West Nile	0	0	0	Negative
Total Mosquitos in Trap	Total Counts		23	5		76	42		0	3	3	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	77	23	Negative	9	4	Negative	0	0	67	Negative
Total Mosquitos in Trap	Total Counts		77	25		9	4		0	0	67	

			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	99	1	Negative	12	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		770	14		12	0		1	6	0	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #2	98	2	Negative	40	1	Negative	32	1	3	Negative
Total Mosquitos in Trap	Total Counts		694	10		40	1		32	1	3	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	94	6	Negative	18	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		109	6		18	2		0	0	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	15	0	Negative	6	1	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		15	0		6	1		0	0	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	97	3	Negative	100	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		2468	156		308	0		8	4	4	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	98	2	Negative	100	0	Negative	10	0	0	Negative
Total Mosquitos in Trap	Total Counts		5448	102		318	0		30	0	0	
# of Mosquitos Tested for PCR	McKenzie (Region I)	Mandaree #1	85	12	Negative	94	6	Negative	10	5	0	Negative
Total Mosquitos in Trap	Total Counts		170	24		404	48		20	10	0	
# of Mosquitos Tested for PCR	McKenzie (Region I)	Mandaree #2	0	0	Negative	89	11	Negative	17	0	0	Negative
Total Mosquitos in Trap	Total Counts		6	3		106	15		17	0	0	
*Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus												

Live Trapping Mosquito Counts 2019												
Week: 10 Dates: July 29 - August 4												
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #1	47	53	Negative	99	1	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		156	143		108	1		0	0	0	
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #2	82	14	Negative	21	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		82	14		21	0		0	4	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1	24	6	Negative	23	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		24	6		23	0		0	0	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2	11	9	Positive West Nile	23	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		11	9		23	0		0	0	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1	89	11	Negative	99	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		145	22		99	0		2	0	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2	99	1	Negative	100	0	Negative	0	12	0	Negative
Total Mosquitos in Trap	Total Counts		317	2		578	0		0	12	0	
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	73	27	Negative	98	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		146	54		882	34		0	2	0	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	78	22	Negative	98	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		154	30		199	20		0	3	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	45	14	Negative	100	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		90	28		824	8		2	10	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	25	1	Negative	27	0	Negative	0	0	18	Negative
Total Mosquitos in Trap	Total Counts		25	1		27	0		0	0	18	

			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	98	2	Negative	61	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		940	20		61	0		1	5	0	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot#2	92	8	Negative	39	0	Negative	23	1	0	Negative
Total Mosquitos in Trap	Total Counts		644	32		156	0		92	4	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	75	25	Negative	86	14	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		289	96		98	20		0	1	1	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	92	8	Negative	9	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		92	8		9	0		0	4	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	71	29	Negative	100	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		3608	1288		1104	16		16	0	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	99	1	Negative	100	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		6644	48		1456	0		12	4	0	
# of Mosquitos Tested for PCR	McKenzie (Region I)	Mandaree #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	McKenzie (Region I)	Mandaree #2										
Total Mosquitos in Trap	Total Counts											
*Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus												

Live Trapping Mosquito Counts 2019												
Week: 11 Dates: August 5 - August 11												
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #1	17	18	Negative	81	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		17	18		81	0		0	1	0	
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #2	64	6	Negative	21	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		64	6		21	0		2	2	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1	0	0	Not Tested	43	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		8	0		52	5		0	0	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2	52	4	Negative	56	1	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		52	4		56	1		0	0	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1	95	5	Negative	24	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		111	5		24	0		5	1	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2	92	8	Negative	99	1	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		122	14		162	4		0	2	0	
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	90	6	Negative	99	1	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		90	6		420	22		0	1	2	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	78	22	Negative	94	4	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		90	22		94	4		0	2	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	20	3	Negative	100	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		20	3		160	0		0	6	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	0	0	Not Tested	10	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		3	3		10	2		0	0	4	

			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	97	3	Negative	38	2	Negative	5	8	1	Negative
Total Mosquitos in Trap	Total Counts		552	28		76	4		10	16	2	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot#2	51	15	Negative	29	1	Negative	68	1	0	Negative
Total Mosquitos in Trap	Total Counts		51	15		29	1		68	1	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	72	21	Negative	15	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		72	21		15	2		0	0	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	12	4	Negative	42	6	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		12	4		42	6		1	2	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	89	11	Negative	99	1	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		182	19		182	2		1	5	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	91	9	Positive Jamestown Canyon	98	2	Positive Jamestown Canyon	22	1	0	Negative
Total Mosquitos in Trap	Total Counts		696	88		516	32		22	1	0	
# of Mosquitos Tested for PCR	McLean (Region VII)	White Shield										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Montrail (Region II)	Parshall										
Total Mosquitos in Trap	Total Counts											
*Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus												

Live Trapping Mosquito Counts 2019												
Week: 12 Dates: August 12 - August 18												
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #1	24	5	Negative	29	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		24	5		29	0		0	1	0	
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #2	44	4	Negative	3	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		44	4		3	0		1	2	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1	38	22	Negative	41	1	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		38	22		41	1		0	0	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2	42	3	Negative	47	3	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		42	3		47	3		0	1	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2										
Total Mosquitos in Trap	Total Counts											
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	22	1	Negative	100	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		22	1		165	0		0	3	0	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	10	0	Negative	49	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		10	0		49	0		0	2	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	0	0	Not Tested	33	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		3	0		33	2		0	5	2	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	0	0	Not Tested	8	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		1	0		8	0		0	0	1	

			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	81	19	Negative	56	12	Negative	11	26	0	Negative
Total Mosquitos in Trap	Total Counts		996	224		112	24		22	52	0	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot#2	98	2	Negative	74	0	Negative	24	12	0	Negative
Total Mosquitos in Trap	Total Counts		176	7		74	0		24	12	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	0	0	Not Tested	4	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		4	1		4	0		0	0	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	0	0	Not Tested	3	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		8	0		3	0		0	0	1	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	97	3	Negative	98	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		443	12		117	2		1	2	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	99	1	Negative	100	0	Negative	2	11	0	Negative
Total Mosquitos in Trap	Total Counts		363	8		196	0		2	11	0	
# of Mosquitos Tested for PCR	McLean (Region VII)	White Shield										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Montrail (Region II)	Parshall										
Total Mosquitos in Trap	Total Counts											
*Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus												

Live Trapping Mosquito Counts 2019												
Week: 13 Dates: August 19 - August 25												
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #1	25	75	Negative	30	0	Negative	0	10	0	Negative
Total Mosquitos in Trap	Total Counts		63	229		30	0		0	10	0	
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #2	90	10	Negative	12	0	Negative	0	25	0	Negative
Total Mosquitos in Trap	Total Counts		137	19		12	0		0	25	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1	0	0	Negative	1	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		2	0		1	0		0	4	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2	0	0	Not Tested	1	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	0		1	0		0	0	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1	0	0	Not Tested	6	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		4	0		6	0		0	0	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2	16	1	Negative	15	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		16	1		15	0		0	0	0	
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	28	2	Negative	100	0	Positive (West Nile)	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		28	2		117	0		1	0	0	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	17	2	Negative	17	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		17	2		17	0		0	1	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	0	0	Not Tested	23	0	Negative	0	3	15	Negative
Total Mosquitos in Trap	Total Counts		5	0		23	0		0	3	15	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	0	0	Not Tested	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		1	0		0	0		0	1	1	

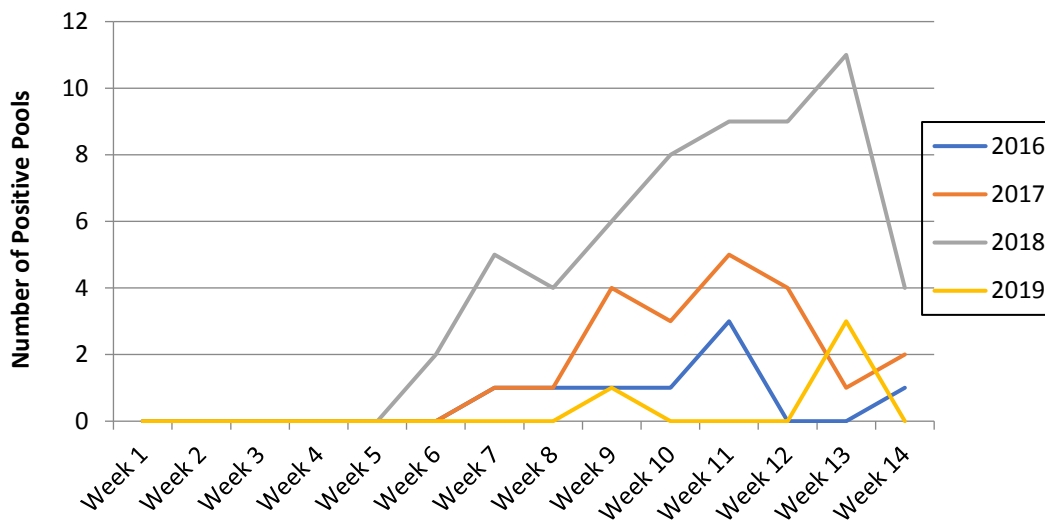
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	93	7	Negative	100	0	Positive (West Nile)	1	99	0	Negative
Total Mosquitos in Trap	Total Counts		1,612	56		240	0		1	244	0	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot#2	79	21	Negative	67	4	Positive (West Nile)	11	62	9	Negative
Total Mosquitos in Trap	Total Counts		132	49		67	4		11	62	9	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	0	0	Not Tested	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		2	0		0	0		0	0	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	10	2	Negative	3	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		10	2		3	0		0	0	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	92	8	Negative	52	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		199	17		52	0		0	8	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	76	24	Negative	100	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		299	133		143	0		0	3	0	
# of Mosquitos Tested for PCR	McKenzie (Region I)	Mandaree #1	32	1	Negative	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		32	1		0	0		0	0	0	
# of Mosquitos Tested for PCR	Montrail (Region II)	Parshall										
Total Mosquitos in Trap	Total Counts											
*Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus												

Live Trapping Mosquito Counts 2019												
Week: 14 Dates: August 26 - September 1												
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #1	35	65	Negative	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		51	91		0	0		0	1	0	
# of Mosquitos Tested for PCR	Burleigh (Region VII)	Bismarck #2	50	10	Negative	2	0	Negative	1	13	0	Negative
Total Mosquitos in Trap	Total Counts		50	10		2	0		1	13	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #1	87	0	Negative	3	1	Negative	0	15	0	Negative
Total Mosquitos in Trap	Total Counts		87	0		3	1		0	15	0	
# of Mosquitos Tested for PCR	Stark (Region VIII)	Dickinson #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #1	29	1	Negative	1	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		29	1		1	0		2	0	0	
# of Mosquitos Tested for PCR	Ramsey (Region III)	Devils Lake #2	0	0	Not Tested	7	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		1	0		7	0		2	0	0	
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #1										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Cass (Region V)	Fargo #2										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #1	41	11	Negative	28	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		41	11		28	0		0	1	0	
# of Mosquitos Tested for PCR	Grand Forks (Region IV)	Grand Forks #2	17	0	Negative	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		17	0		0	0		0	5	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #1	0	0	Not Tested	9	1	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	3		9	1		0	3	0	
# of Mosquitos Tested for PCR	Stutsman (Region VI)	Jamestown #2	3	11	Negative	1	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		3	11		1	0		0	1	0	

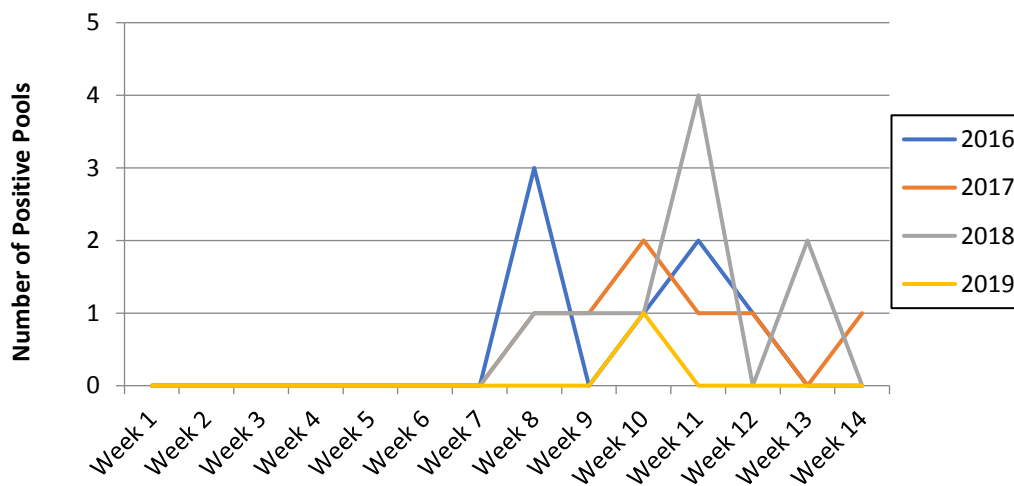
			Aedes spp.			Culex spp.			Anopheles/Culisetta spp.			
			Aedes vexans	Aedes spp.	PCR Results	Culex tarsalis	Culex spp.	PCR Results	Anopheles spp.	Culisetta spp.	Coquillettidia spp.	PCR Results
# of Mosquitos Tested for PCR	Ward (Region II)	Minot #1	92	8	Negative	1	2	Negative	0	99	1	Negative
Total Mosquitos in Trap	Total Counts		888	36		1	2		0	198	2	
# of Mosquitos Tested for PCR	Ward (Region II)	Minot#2	35	4	Negative	3	0	Negative	5	23	0	Negative
Total Mosquitos in Trap	Total Counts		35	4		3	0		5	23	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #1	0	0	Not Tested	0	0	Not Tested	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		2	0		0	0		0	1	0	
# of Mosquitos Tested for PCR	Richland (Region V)	Wahpeton #2	0	0	Not Tested	5	0	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		0	0		5	0		0	1	0	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #1	95	5	Negative	7	0	Negative	0	8	2	Negative
Total Mosquitos in Trap	Total Counts		299	6		7	0		0	8	2	
# of Mosquitos Tested for PCR	Williams (Region I)	Williston #2	96	4	Negative	3	2	Negative	0	0	0	Not Tested
Total Mosquitos in Trap	Total Counts		333	6		3	2		0	1	0	
# of Mosquitos Tested for PCR	McLean (Region VII)	White Shield										
Total Mosquitos in Trap	Total Counts											
# of Mosquitos Tested for PCR	Montrail (Region II)	Parshall										
Total Mosquitos in Trap	Total Counts											
*Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus												

North Dakota Mosquito Surveillance Taqman® Real Time RT-PCR results for West Nile Virus

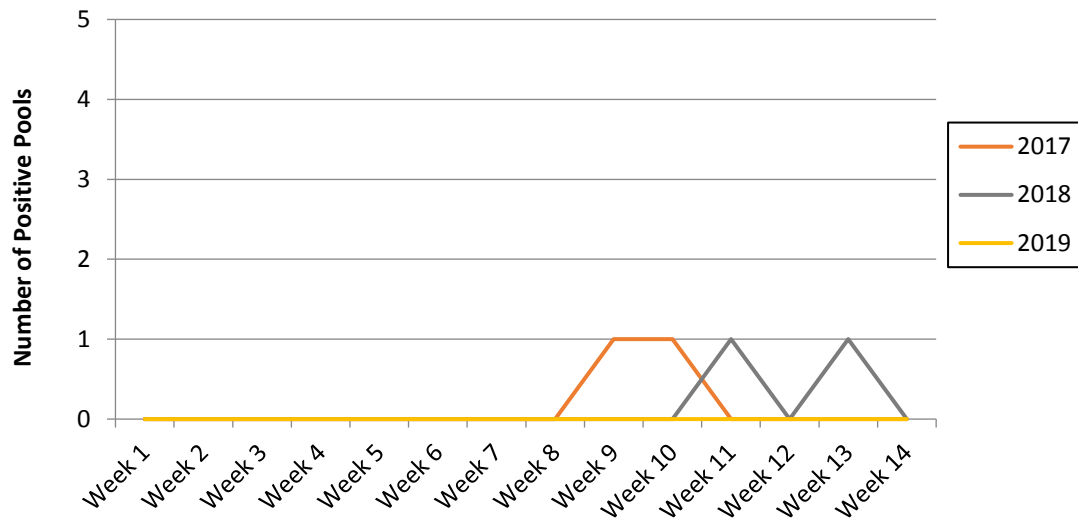
Culex Spp. West Nile RT-PCR



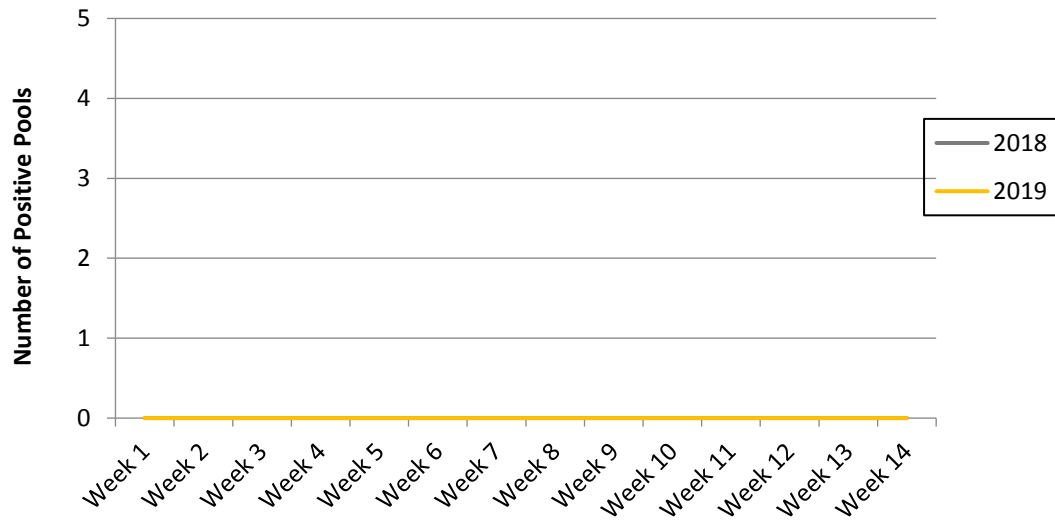
Aedes Spp. West Nile RT-PCR



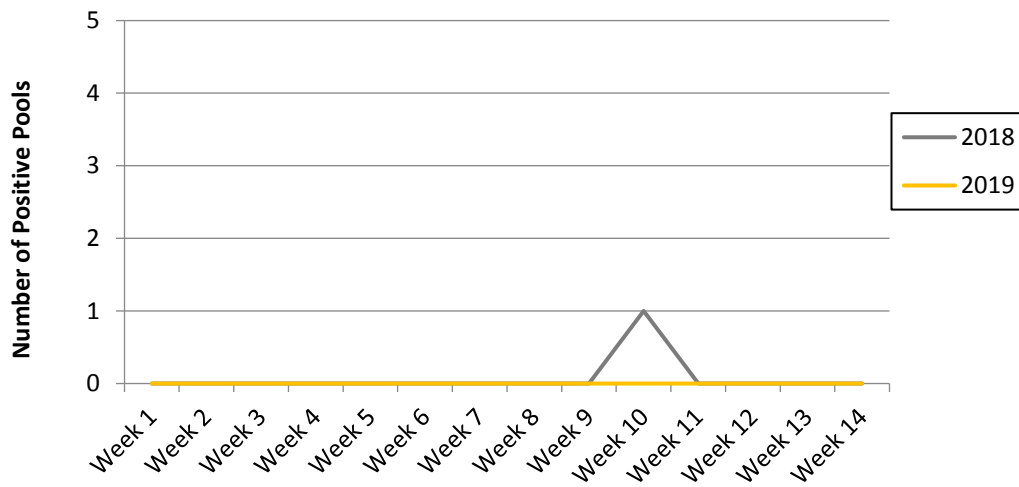
***Anopheles/Culisetta* spp. West Nile RT-PCR**



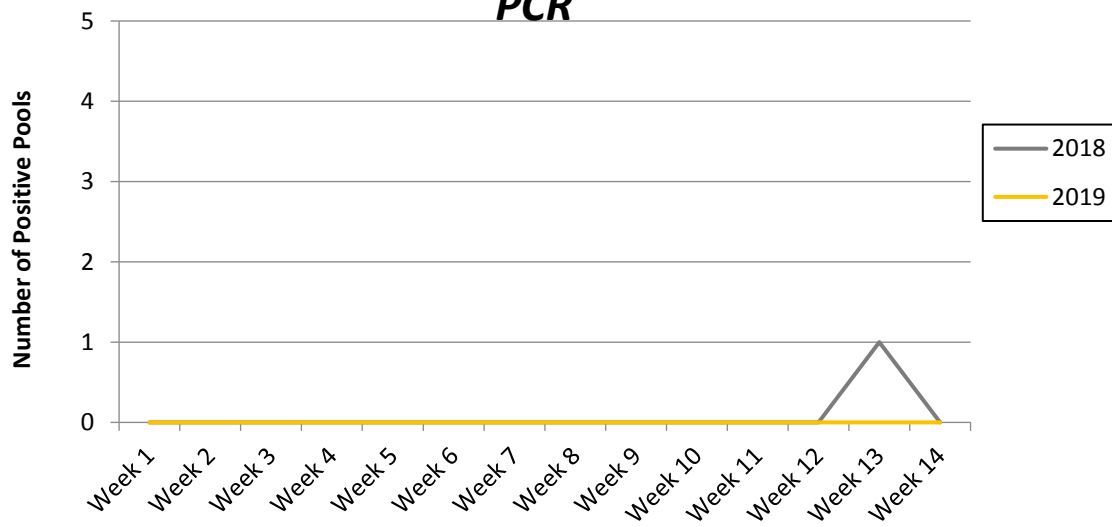
***Culex* Spp. LaCrosse Virus RT-PCR**



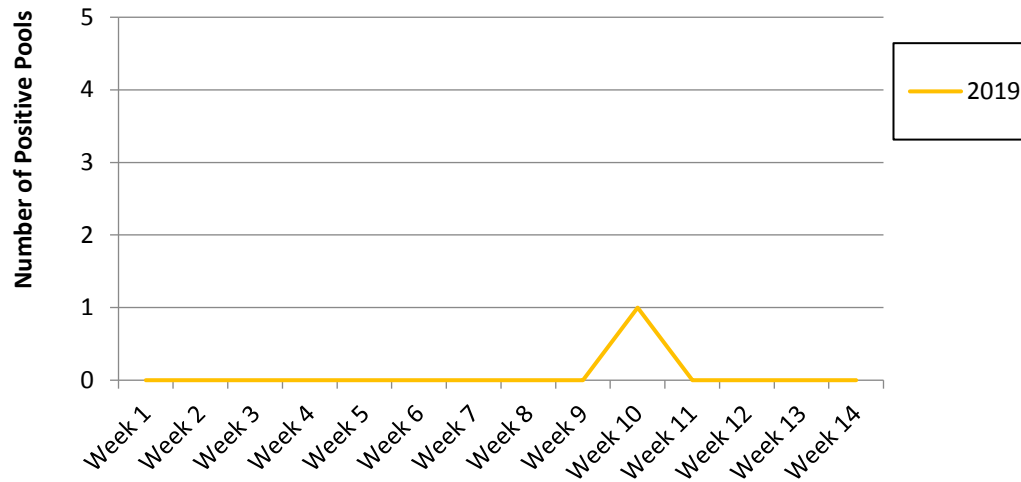
***Aedes* Spp. LaCrosse Virus RT-PCR**



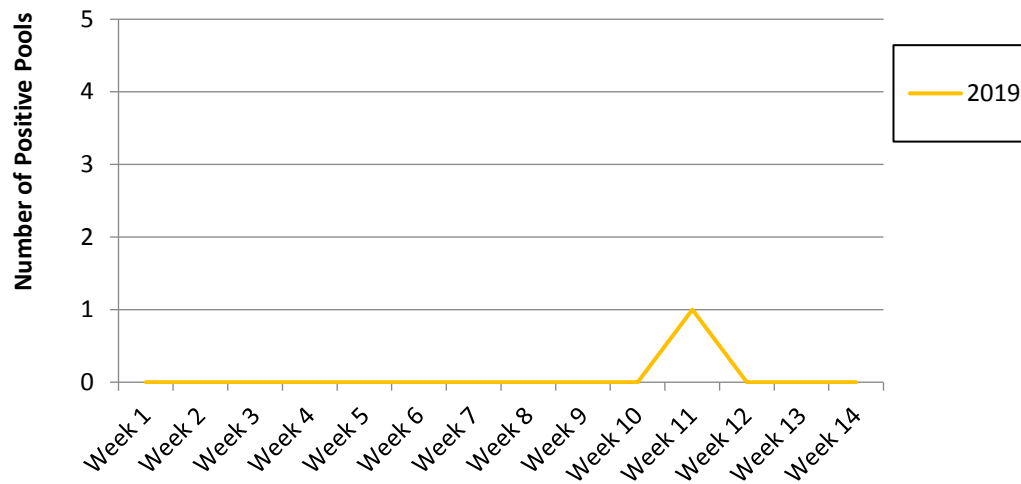
***Anopheles/Culisetta* spp. LaCrosse Virus RT-PCR**



***Culex* Spp. Jamestown Canyon Virus RT-PCR**



***Aedes* Spp. Jamestown Canyon Virus RT-PCR**



Appendix D: 2018 Dead Bird Testing

In 2017, the North Dakota Department of Health mosquito surveillance team began testing dead birds from around the state for mosquito-borne illness. As birds are the primary host for mosquitos to feed upon, mosquito-borne infections may show up in the bird population before the human population. To perform this testing, RNASound™ RNA Sampling Cards were used. RNASound™ RNA Sampling Cards were sent to vector control sites around the state, where the vector control personnel swabbed the oral cavity, or throat, of the bird. The swab was then rolled over the card, which contains a solution that stabilizes the virus. The card was then submitted for testing. The cards were tested in the same manner as the live mosquito pools, and tested for the same seven viruses: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, Jamestown Canyon Virus, La Cross Encephalitis, St. Louis Encephalitis, and Zika Virus. The dead bird program was unchanged in 2019.

Dead Bird Submissions 2019					
Submission Week	City	Date of Collection	ID Number	PCR Results	Bird Identification
Pre-Season	Grand Forks	5/16/2019	GFDBS19001	Negative	Crow
5	Grand Forks	6/27/2019	GFDBS19004	Negative	Grackle
6	Grand Forks	7/1/2019	GFDBS19005	Negative	Crow
7	Williston	7/11/2019	WDBS17017	Negative	Blackbird
10	Bismarck	7/29/2019	BDBS19001	Negative	Blackbird

***Targets Tested: West Nile Virus, Western Equine Encephalitis, Eastern Equine Encephalitis, LaCrosse Virus, Jamestown Canyon Virus, Saint Louis Encephalitis, and Zika Virus**

References

1. American Mosquito Control Association. (1990). *Organization for Mosquito Control* (16-17). Baltimore, Maryland.
2. Darsie, R.F., Jr. and Ward, R.A. (1981). *The Identification and Geographical Distribution of the Mosquitoes of North America North of Mexico*. Fresno, California: American Mosquito Control Association.
3. Moore, C.G. and Pratt, H.D. (1993). *Mosquitoes of Public Health Importance and Their Control* (1-43). Atlanta, GA: Centers for Disease Control and Prevention.
4. Cross, Michael N. (1994, 1995, 1996, 1997, and 1998, September) *1994, 1995, 1996, 1997, and 1998 North Dakota Arbovirus/Mosquito Surveillance Program Annual Reports*. Bismarck, North Dakota: North Dakota Department of Health, Division of Microbiology.
5. Nies, Nicole. (2000). *2000 North Dakota Mosquito Surveillance Program Report*. Bismarck, North Dakota: North Dakota Department of Health, Division of Microbiology.
6. Irmen, Chris and Tescher, Todd. (2001, August). *2001 North Dakota Mosquito Surveillance Program Report*. Bismarck, North Dakota: North Dakota Department of Health, Division of Microbiology.
7. Bold, Tyler and Schulz, Travis. (2002, October). *2002 North Dakota Mosquito Surveillance Program Report*. Bismarck, North Dakota: North Dakota Public Health Laboratory.
8. Schulz, Travis; Bichler, Mike; Voller, Laura; Hoff, Jennifer. (2003, December). *2003 North Dakota Mosquito Surveillance Program Report*. Bismarck, North Dakota: North Dakota Department of Health, Division of Microbiology.
9. Goddard, Laura, et. al. (December 2002). *Vector Competence of California Mosquitoes for West Nile virus*. Emerging Infectious Diseases (Vol. 8, No. 12) (1385-1391). University of California, Davis, California.
10. Henke, Michelle; Iverson, Sara; Auen, Cari. (2008). *2008 North Dakota Mosquito Surveillance Program Report*. Bismarck, North Dakota: North Dakota Department of Health, Division of Laboratory Services — Microbiology.
11. <http://www.ag.ndsu.edu/pubs/plantsci/pests/e472s.htm>
12. <http://www.cdc.gov/sle/technical/epi.html>
13. http://diseasemaps.usgs.gov/sle_nd_human.html
14. <http://www.cdc.gov/chikungunya/pdfs/surveillance-and-control-of-aedes-aegypti-and-aedes-albopictus-us.pdf>
15. <http://www.terminix.com/pest-control/mosquitoes/facts/mosquito-disease-2015-2016/>
16. RNASound™ RNA Sampling Card Ready Punched™ Package Insert. Fortius Bio.
17. The California Department of Public Health Vector-Borne Disease Section. West Nile Virus Dead Bird Surveillance Program. *Safe Practices RNA Preservation Card Sampling of Dead Birds for West Nile Virus Testing*.
18. Foss, Leslie; Reisen, William K; Fang, Ying; Kramer, Vicki; Padgett, Kerry. (2016). Evaluation of Nucleic Acid Preservation Cards for West Nile Virus Testing in Dead Birds. PLOS One. June 24, 2016. <https://doi.org/10.1371/journal.pone.0157555>